ORDER

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

6000.15C

08/11/00

Subj: General Maintenance Handbook for Airway Facilities

FOREWORD

This order establishes the Airway Facilities (AF) maintenance program. General administrative and management standards, procedures, and guidelines are provided the management, operation and maintenance of the National Airspace System (NAS).

Related directives provide detailed guidance in the specialized areas of administrative management and technical applications. This order complements these directives and should be co-located with the Airway Facilities maintenance handbooks.

ORIGINAL SIGNED BY

Robert D. Long

(for) Alan R. Moore
Director of Airway Facilities

CHAPTER 1. GENERAL

1. PURPOSE.

This order provides overall maintenance philosophy, general maintenance procedures, and requirements essential for managing and maintaining the National Airspace (NAS). Its purpose is to ensure that all facilities are capable of satisfying the NAS mission regardless of who maintains the facility.

2. DISTRIBUTION.

This order is distributed to the division level in Airway Facilities, Air Traffic, Flight Standards, and Airports Safety and Standards in Washington; to the Logistics Center and the Academy at the Aeronautical Center; to the division level at the ATC Engineering and Test Division; CNS Engineering and Test Division at the Technical Center; to branch level in the regional Airway Facilities, Air Traffic, Flight Standards, and Airports Divisions; and to Airway Facilities and Air Traffic field offices with a standard distribution.

3. CANCELLATION.

Order 6000.15B, General Maintenance Handbook for Airway Facilities, dated August 1991, is canceled.

4. EXPLANATION OF CHANGES.

This revision incorporates changes resulting from field, regional, and headquarters comments, organizational realignment, and the evolution of the NAS. These changes include:

a. Revising the logging procedures to make it generic and applicable to any logging method.

b. Moving specific procedures to a separate order.

c. Adding guidance for distribution and use of maintenance data terminals (MDT).

d. Adding a list of required directives.

e. Stressing the requirement for tracking the percentage of Periodic Maintenance (PM) tasks accomplished.

f. Revising the power system certification requirement to a specification on function.

g. Adding a requirement for certification of decision support systems.

h. Clarification of certification as an inherently governmental function.

i. Adding a new Appendix 2, Maintenance and Support Levels, describing the various levels of maintenance and their responsibilities.

j. Introducing service groupings in Appendix 3, Systems, Subsystems, and Services Requiring Certification, consistent with the NAS Service Analysis Tool.

k. Publishing Appendix 3 on the Internet as the primary means of distribution.

l. Adding risk management concepts throughout the order.

m. Adding a requirement for the annual calibration of Remote Monitoring Subsystem (RMS) equipment if used for remote certification.

5. GUIDING PRINCIPLE.

Airway Facilities (AF) shall meet the needs of the Federal Aviation Administration (FAA) operational mission in accordance with FAA standards and procedures, ensuring safe operation of the NAS, with continually improving performance at a minimized cost.

6. SCOPE.

This order establishes common maintenance and certification requirements for all systems and services in the NAS, and maintenance standards for all FAA maintained facilities. This order takes precedence over the 6000 series maintenance handbooks.

a. General Maintenance Philosophy. The Airway Facilities maintenance program dedicated to ensuring safety and providing the best possible service for the lowest possible cost. The FAA is continually improving NAS systems and services, and ensuring the requirements of our customers are being anticipated and met. Stringent risk management practices shall be incorporated into all maintenance actions prior to project implementation, configuration changes, or scheduled interruptions of NAS systems or services so that our services are available and reliable. Environmental and national defense issues shall be given full consideration in the planning and conduct of NAS maintenance activities.

b. Certification. Certification is the quality control method used by AF to ensure its facilities are providing their advertised service. AF's independent discretionary judgment about the provision of advertised services, the need to separate profit motivations from operational decisions, and the desire to minimize liability, make the regulatory function of certification and oversight of the NAS an inherently governmental function. Verification is the process by which non-Federal personnel (as defined in FAR 171 and Order 6700.20, Non-Federal Navigational Aids and Air Traffic Control Facilities) perform a similar quality control function. Airway Facilities is responsible for overseeing the verification process.

c. Maintenance Activities. Airway Facilities maintenance activities are both periodic and corrective in nature.

(1) Periodic maintenance (PM) includes performance checks, preventive maintenance inspections, and routine maintenance. PMs are designed to minimize unscheduled interruptions as well as extend the life of the equipment and infrastructure.

(2) Corrective maintenance is maintenance performed to identify or correct a problem. It is typically performed to accomplish the restoration of service to the users of the NAS after an unscheduled interruption.

d. Risk Management. Risk Management is the process of identifying, and mitigating the probability of an undesirable event. When maintenance activities are performed, risk assessment analysis techniques shall be used to determine the impact of AF maintenance activities. Risk management should consider the following:

(1) What the system's function is within the NAS.

(2) Whether a scheduled interruption is required and properly coordinated.

(3) The criticality of the service or system.

(4) Whether this service or system is not redundant.

(5) Whether the interruption occurs during peak traffic periods.

(6) Weather conditions.

e. Restoration. When unscheduled interruptions occur and corrective is required, system or service restoration will be done by efficiently utilizing appropriate resources, so that the interruption/outage is minimized and customer requirements are met.

7. TERMINOLOGY AND DEFINITIONS.

Appendix 1, Definitions, lists the definitions used by the System Specialist. These definitions apply to terms used in maintenance handbooks and may not agree with those used in other directives.

8. MAINTENANCE RESPONSIBILITY.

Title 49 of the United States Code assigns the FAA the legal responsibility for ensuring the proper operation of equipment used in air navigation and air traffic control systems, with all its implications before boards of inquiry and the courts. These implications are beyond the internal interest of FAA management and and involve public scrutiny, expectations, and Tort law. This responsibility to AF. AF is responsible for management, maintenance, and operation of the NAS infrastructure. AF will determine the concepts, philosophies, and implementation methods for fulfilling these responsibilities.

9. GENERAL MAINTENANCE GUIDELINES.

Maintenance of AF systems, subsystems, and equipment in the NAS shall be guided by the following general principles:

a. Availability and reliability of air traffic control, communication, navigation, and surveillance services shall be maximized to the extent practical, consistent with established FAA policies, procedures, and practices. The quantity and duration of interruptions shall be minimized. Scheduled interruptions shall be coordinated with appropriate AT personnel.

b. AF shall conduct a maintenance program to ensure maximum efficiency in system, subsystem, and equipment performance, designed to minimize unscheduled interruptions.

c. AF personnel shall react promptly to unscheduled interruptions as well as potential problems, consistent with established FAA policies, procedures, and practices.

d. Uniform national standards, tolerances/limits, schedules, and procedures maintenance shall be promoted. NAS Change Proposals (NCP) shall be granted judiciously. Site adaptation will be permitted, but shall not conflict, negate, circumvent, or lessen the effectiveness of the national standards unless permitted by an approved NCP.

e. An adequate number of highly competent technical System Specialists will be assigned necessary workloads. This skilled staff shall be trained in the specialized needs of AF as necessary.

f. The types and quantities of test equipment, tools, spare parts, etc., required by System Specialists to perform their technical duties, will be provided consistent with FAA policies, practices, and procedures.

g. Comprehensive, accurate, current, and timely maintenance technical documentation shall be provided to define and specify the duties, responsibilities, and authority granted to the System Specialist at the regional and System Management Office (SMO) levels.

h. An active feedback system shall be implemented throughout the maintenance organization. It should provide field input to the NAS Operations Program and other cognizant headquarters offices. The feedback system includes, but is not limited to:

(1) Employee suggestions.

(2) Unsatisfactory Condition Reports (UCR).

(3) Formal and informal on-site inspections.

(4) Proposed modifications.

(5) Directive improvement reports.

(6) NAS Change Proposals (NCP).

(7) Informal letters.

i. All field personnel should submit, through appropriate administrative channels, information on actual or potential problems, deficiencies, errors, or suggested improvements that may affect the FAA's ability to conduct its mission in a safe and efficient manner.

j. All System Specialist shall exercise proper personal and equipment safety precautions, fire prevention techniques, and safe working practices when performing maintenance activities.

k. AF personnel should strive to achieve quality work and to take pride in all of their maintenance activities.

l. The quality of the nation's environment and natural resources shall be protected and enhanced consistent with the maintenance mission. Environmental pollution and inconvenience to the general public shall be avoided to the maximum extent.

m. The AF maintenance organization shall foster a cooperative working relationship with other segments of the FAA, particularly the Air Traffic and Flight Inspection organizations. A comparable liaison shall be maintained with other relevant entities such as the military or other government agencies, local authorities, airport managers, fixed base operators, and the general public.

10. COMPUTER WORKSTATIONS.

AF computer workstations, desktops or portable laptops, are categorized as either NAS Support Workstations, or NAS Operational Computer Workstations.

a. NAS Support Workstation. A NAS Support Workstation is a computer that is used in support of the NAS but does not physically touch or connect to any operational NAS system. Support Workstations are usually associated with those in Headquarters, Regional Offices, on a manager’s desk, or on a secretary’s desk, etc.

b. NAS Operational Workstation. A NAS Operational Computer Workstation is a workstation directly connected to a NAS system. It can be further subdivided into 2 subcategories; Maintenance Data Terminal (MDT), and System Workstation.

(1) A MDT is a computer workstation that is used to connect directly to operational NAS systems. A MDT is not an integral or imbedded part of any operational NAS system and it can be turned off with no direct negative impact to the operational NAS system. Additionally, an MDT may perform all the functions of a NAS Support Workstation.

(2) A System Workstation is a computer workstation that is an integral or imbedded part of an operational NAS system. It may perform an MDT activity or a NAS Support activity; however removing or turning off the workstation would directly cause a negative impact to the operational NAS system.

11. MAINTENANCE DATA TERMINAL.

The Maintenance Data Terminal (MDT) is a tool to be used by the System Specialist for the maintenance of the NAS. All specialists shall have ready access to an MDT. System Specialists that perform their duties at remote locations, without a dedicated MDT, shall be assigned their own unique MDT laptop computer. Specialists that perform their duties in a work center environment shall utilize a common MDT desktop computer if one is not assigned to them. Typical functions include, but are not limited to:

a. Downloading documents including drawings and schematics.

b. Accessing the FAA's Internet and Intranet servers.

c. Accessing electronic mail.

d. Remote maintenance monitoring and control.

e. Performing periodic or corrective maintenance.

f. Record keeping, logging, or reporting.

g. Supporting or providing training.

h. Word processing and other office related work, etc.

12. REFERENCED DOCUMENTS.

The nature of this document requires reference to numerous publications. To avoid frequent revision, for the purpose of changing references to the latest issue, personnel shall consider all references as the most recent edition.

13. CONFIGURATION MANAGEMENT.

Many NAS items such as software, hardware, and documents have been placed under configuration control. These items are listed in Document NAS MD-001. These items shall not be modified and placed in service without proper authorization.

14. RECOMMENDATION FOR CHANGES.

Users are encouraged to submit recommendations for improvement to this order. Pre-addressed comment sheets are provided at the back of this order.

15. EMPLOYEE SUGGESTIONS.

Suggestions for technical improvements to items not under configuration management are submitted in accordance with Order AF 3450.1, AF Technical Employee Suggestion Program.

16.-199. RESERVED.

CHAPTER 2. ADMINISTRATIVE MANAGEMENT

SECTION 1. TECHNICAL DOCUMENTATION

200. INTRODUCTION.

A key to effective maintenance is comprehensive, accurate, and usable maintenance technical documentation. This section contains a description of various documents, defines their hierarchy, and provides guidance on their use.

201. FAA DIRECTIVES.

FAA directives consist of national, regional, and local orders, notices, and supplements issued in accordance with Order 1320.1, FAA Directives System. The following examples are included in this category:

a. Maintenance handbooks.

b. Electronic Equipment Modifications (EEM).

c. Plant Equipment Modifications (PEM).

d. System Support Modifications (SSM).

e. Other orders, notices, and supplements issued by headquarters, regions, or field offices.

202. DIRECTIVES CHECKLIST.

Airway Facilities System Specialists should consult local directives, checklists, and other publications to determine those applicable and current to their maintenance requirements. System Service Center (SSC) Managers shall provide a definitive list of the required maintenance handbooks that shall include the latest versions of any maintenance handbooks for equipment or infrastructure at that work center. The list shall include at least the following directives:

a. 6000.30, Policy for Maintenance of the NAS Through the Year 2000.

b. 6000.15, General Maintenance Handbook for Airway Facilities.

c. 6040.15, National Airspace Performance Reporting System.

d. 6000.48, General Maintenance Handbook for Automated Logging.

e. 6030.31, Restoration of Operational Facilities.

f. 6000.40, Monitoring Policy for the Maintenance Control Center (MCC) of the National Airspace (NAS).

g. 6000.50, Airway Facilities National Airspace System Operations Handbook.

h. 6000.5, Facility, Service, and Equipment Profile.

i. 6030.45, Facility Reference Data File.

j. 3900.6, Occupational Safety Program for Airway Facilities Personnel.

k. 3900.14, Safety Climbing Equipment at Existing NAS Facilities.

l. 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting, or regional equivalent.

m. 1370.82, Information Systems Security Program.

203. MAINTENANCE HANDBOOKS.

Maintenance handbooks provide system-oriented information, tying together the various units, and/or components that comprise a system, subsystem, or equipment. Maintenance handbooks should contain the following:

a. General information and requirements.

b. Technical characteristics.

c. Standards and tolerances, also known as the blue pages.

d. Periodic Maintenance tasks, including the accomplishment interval with each task stipulated in precise terms; i.e., weekly, quarterly, etc. or in general terms; e.g., as required, every 3 to 4 months. Changes to PM tasks or certifications shall be coordinated with the office of primary responsibility (OPR) for the National Periodic Maintenance/Certification Scheduling (PMS) database.

e. Maintenance Procedures and other maintenance activities.

f. Flight inspection.

g. Certification Requirements.

204. LOCALLY DEVELOPED DIRECTIVES.

Regions or SMOs may issue directives to supplement published guidance, as to meet local conditions, implement local policy, or fill a need prompted by the absence of appropriate published guidance. This shall not conflict, negate, or lessen the effectiveness of any documentation issued at a higher organizational level without NCP approval. Supplemental directives shall be canceled when no required. Copies of all locally developed publications shall be forwarded to the next organizational element no later than the time of issuance.

205. CONTRACTOR-DEVELOPED PUBLICATIONS.

Contractor-developed publications are documents prepared and/or furnished by an equipment manufacturer as part of its contractual obligations to FAA. The newer publications contain an identifying publication number in anticipation of the implementation of a technical issuance directive. These publications are distinct from the general FAA directives system, and include instruction books, instruction booklets, and manufacturer's brochures. They may not be suitable as the maintenance

handbook. The Operational Support organization (AOS) is responsible for such judgments.

206. TECHNICAL INSTRUCTION BOOKS.

Technical Instruction (TI) books are written for specific systems. The TI provides the following benefits in the AF maintenance program:

a. Quick and precise access to system, subsystem, and equipment details.

b. Improve comprehension of NAS technology.

c. Facilitate troubleshooting, periodic, and corrective maintenance.

d. Elimination of redundant training material.

e. Guidance allowing field technical personnel, in some cases, to successfully maintain FAA systems, subsystems, and equipment at FAA standards with minimal training.

207. MISCELLANEOUS DOCUMENTS.

The following are examples of documents in the miscellaneous category:

a. Military publications; e.g., Air Force technical orders.

b. Systems research and development reports.

c. Facility inspection reports.

d. Flight inspection reports.

e. Preprinted forms.

f. Letters and memorandums of agreement (LOA and MOA, respectively).

g. Standard Operating Procedures (SOP).

208. DOCUMENTATION ACCURACY.

All documentation shall be accurate and adequate enough to meet the requirements of field personnel. Users of maintenance documents are requested to report any errors or conflicts and to make suggestions for improvement. Proposed corrections shall be forwarded through appropriate administrative channels to the regional office for evaluation and subsequent transmittal to the OPR for action.

209. DOCUMENT HIERARCHY.

Airway Facilities personnel shall adhere to all documented maintenance
If the published requirements conflict, the following guidelines shall apply to all systems, subsystems, and equipment:

a. FAA directives shall take precedence over non-FAA prepared publications; e.g., military manuals.

b. Order 6000.15 shall take precedence over all other AF 6000 series maintenance directives.

c. Maintenance handbooks shall take precedence over technical instruction books.

d. Headquarters publications (both FAA-issued and FAA-adopted) shall take precedence over regional and local publications.

e. Standard Operating Procedures (SOP) provide detailed interpretation of directives but do not supersede them.

f. Conflicts between comparable publications shall be reported as indicated in paragraph 208.

210. DEVIATIONS FROM PUBLISHED REQUIREMENTS.

When the requirements of FAA directives cannot be met, the following guidelines apply:

a. Deviations From Published Procedures. The maintenance procedures published in technical documentation are prepared for general use, and will normally be used for routine system, subsystem, and equipment maintenance. Local conditions, such as siting peculiarities or lack of test equipment, may occasionally require substitute procedures to achieve the goal of the published procedure. Such procedures are acceptable provided operational tolerances are maintained.

b. Deviations From Published Schedules. Maintenance intervals specified in wide technical documentation may be shortened, but may not be lengthened except by an NCP.

c. Deviations From Standards. The standards, tolerances, or adjustment procedures contained in applicable maintenance handbooks represent operational requirements for all facilities.

(1) Some facilities may have been commissioned with standards/tolerances and/or procedures that differ from those specified in maintenance handbooks. This occurs when standards are nonexistent at the time of commissioning.

(2) These facilities shall adopt the prescribed standards/tolerances and/or procedures promptly once they are available.

(3) Regions shall obtain an NCP for the requirements that can not met by readjustment or revision of procedures. During the interim period, operating parameters and procedures established at facility commissioning shall be considered as standard for that facility. Tolerances to the parameters shall be commensurate with those established for similar parameters published in the maintenance handbook.

211. DOCUMENTATION OF DEVIATIONS FROM PUBLISHED REQUIREMENTS

When one or more of the "shall" requirements in a maintenance handbook or TI cannot be met, a request for an NCP shall be submitted as soon as practical to the office in accordance with Order 1800.8, National Airspace System Configuration Management. The NCP shall fully describe the circumstance and contain a detailed justification for the request. A copy of the NCP request and approved configuration control decision (CCD) shall be filed at the site.

a. If an NCP is requested for a regional supplement to a FAA directive for conditions within the specified provision of the supplement, approval of the request is delegated to the regional OPR.

b. If a NCP is requested of any FAA directive requirement, the regional OPR disapprove, but does not have approval authority for the request.

c. FAA AF Headquarters level of approval is required on deviations to requirements, standards, and criteria specified in FAA directives.

d. NCPs affecting baseline documentation should be processed in accordance the requirement of Order 1800.8 for all systems under configuration management.

212. DOCUMENTATION OF TIME AND DATE ENTRIES.

Since NAS facilities are dispersed over a wide range of time zones, all documented time and date entries shall use Coordinated Universal Time (UTC) and date for standardization.

213. DOCUMENTATION DISTRIBUTION AND ACCESSIBILITY.

a. Document Location. Maintenance handbooks, specifying the policies, practices, duties, and responsibilities that govern the activities of AF field personnel, shall be readily available for those who require a copy. Maintenance handbooks related to maintenance of the facility shall be available at the site or routinely carried by all personnel with maintenance responsibility for the site. Maintenance handbooks related to support; i.e., roads, structures, electrical systems, etc, of a facility are not required to be filed at the site. They must, however, be readily available in a central location for use by System Specialists when required. The first-level technical supervisor shall designate the location of directives.

b. Contractor-Developed Publications. Equipment instruction books and booklets are distributed as follows:

(1) Two copies of the final instruction books will be distributed to each equipment location, when available. Additional or replenishment copies of these books can be provided by the FAA Logistics Center (FAALC).

(2) One or two copies are distributed per addressee on the distribution list, developed in accordance with Order 1320.37, Contractor Developed Equipment Instruction Books, to the regional AF Division, FAA Technical Center, the Aeronautical Center (FAA Academy), FAA Logistics Center, and the National Engineering Field Support Division.

c. Electronic/Plant Equipment Modifications/Maintenance Handbooks, and Changes to Contractor-Developed Publications. Copy requirements for field distribution are established according to the Facility, Service, and Equipment Profile (FSEP) by cost center code and matched with addresses in the AF Field Address File. Mailings are direct to the field office according to Order 1720.30, Distribution of Systems Maintenance Service Technical Directives Affecting Airway Facilities.

d. Other FAA Technical Directives. Maintenance technical documentation, other than those types included in the above subparagraphs, are distributed directly on an "as needed" basis in accordance with Order 1720.18, FAA Distribution System.

214. UPDATING TECHNICAL DOCUMENTATION.

When changes are made to equipment that require changes to equipment documentation, both the Maintenance handbook and Technical Instruction Book will be updated as appropriate. The maintenance handbook shall not be used to update or change the technical instruction book. Such actions are properly handled by electronic or equipment modifications (EEM or PEM.) Duplication of information contained in technical instruction books should be avoided.

215. FILING OF DOCUMENTATION.

Maintenance documentation shall be filed on-site in accordance with Order 1320.1 in such locations as necessary to ensure accessibility and availability by all AF personnel. When documentation is received, it shall be filed promptly.

216. GOVERNING DIRECTIVES.

For further details on documentation requirements, refer to Appendix 5, List of Related Publications in this order.

217.-219. RESERVED.

SECTION 2. REPORTING AND RECORD FORMS

220. INTRODUCTION.

This section describes various FAA forms that System Specialists will use in the performance of day-to-day technical duties. Reference to FAA directives that authorize and explain the use of the forms are provided where appropriate.

221. FACILITY REFERENCE DATA FILE (FRDF).

a. The Facility Reference Data File (FRDF) is a collection of documents providing a comprehensive, quantitative, and permanent record showing how systems, subsystems, or equipment performed during initial acceptance, and after modifications or modernization.

b. Information in the FRDF is required in connection with joint acceptance inspection (JAI) and commissioning activities. Historical information serves as a comparison from which day-to-day performance can be evaluated, and may contain significant technical data used as a reference during system, subsystem, or equipment certification activities. Order 6030.45, Facility Reference Data File, provides guidance on the preparation and use of this data file.

222. FAA FORM 6000 SERIES, TECHNICAL PERFORMANCE RECORD (TPR).

a. Purpose of Form. The 6000 series forms provide a technical performance record of a system or equipment over a specified period of time. This information is collected and recorded on a periodic or on an as-needed basis as specified in the appropriate maintenance handbooks. “Measure and record” or similar language in a maintenance handbook denotes a requirement for a TPR.

b. Establishment of Form. Maintenance handbooks establish the requirement for performance record form. The following forms may be used:

(1) A standard preprinted form.

(2) FAA Form 6000-8, Technical Performance Record - Continuation or Temporary Record/Report form.

(3) A blank computer-generated form, with the approval of the regional Airway Facilities Division.

c. Use of Form. Technical performance records shall be maintained for each facility having an individual geographic location. In addition, performance records shall be maintained for each individual set of equipment within a facility; e.g. channel A and channel B, or equipment number 1 and number 2, main and standby. All entries shall be made with a blue or black ballpoint pen or typewriter; computer entered values are not authorized. When the FAA Form 6000-8 is used, column headings shall designate the parameter or appropriate manufacturer's documentation to be recorded. These forms may be developed to fit the needs of one or more specific types of systems or equipment.

d. Applicability of Guidance. The information contained in the succeeding subparagraphs will generally apply to all technical performance record forms issued. Maintenance handbooks will provide specialized guidance on the preparation of forms. If other guidance on the preparation of FAA Form 6000.8 conflicts with this order, this order shall take precedence.

e. Corrections. Erasures are not allowed; errors shall be voided by a single line strikeout and the correct information neatly inserted. The initials of the person making the correction(s) shall be placed adjacent to the lined out portion.

f. Entry Frequency. Normally, line entries shall be made as frequently as the normal maintenance interval (daily recorded once per day, weekly once per week, etc.) Exceptions to this interval are acceptable when additional documentation is required in cases such as:

(1) Post-accident/incident evaluations.

(2) Restoration activities.

g. Heading Entries. The facility block shall contain the facility identifier followed by the facility type contraction; i.e., RNO ASR. The facility type contraction and the facility location shall agree with the current FSEP list.

h. Column Headings. The column headings on the form are system performance indicators checked or measured most frequently. Do not cross out, paste over, or modify specified column headings unless directed by the maintenance handbook. Enter not applicable (N/A) if the parameter column is not applicable to the equipment involved. Additional space for other parameters is available on the form itself or on continuation sheets; i.e., FAA Form 6000-8. The regions or SMOs may utilize this additional space for local purposes as required.

i. Date and Time Entries. The month and year shall be entered in the date heading. When the form is used to cover multiple months, enter the year in the date heading and month and day on each line entry. Time entries shall be made in UTC. An old form may be replaced with a new one as needed. Forms having few entries may be used over multiple years; however, only the first year shall be entered in the date heading. The new-year entered on a separate line entry in the date column shall separate subsequent years.

j. Nominal Block Entries. Nominal entries shall note the desired parameter value as prescribed in maintenance handbooks (blue sheets), equipment instruction

books, or other appropriate reference data. The other appropriate reference data may be based upon commissioning, flight or ground inspection, or locally developed data. The following instructions shall apply:

(1) Numerical Entries.

(a) When the column heading data is identified in the maintenance handbook or equipment instruction books, the standard value shall be used in the nominal block. The operating tolerance/limit values shall be included in the parameter column heading immediately above the nominal block as the maximum and minimum values, or in the line immediately below the nominal block if the parameter column heading does not have room.

(b) When the column heading data is not identified in the maintenance handbook or equipment instruction book, the nominal value shall be the Facility Reference Data File value. If that value is not available, then the commissioning, flight/ground inspection, or locally developed value shall be used.

(c) When a nominal value changes the current form shall be terminated and a new form initiated to reflect the changed value. The reason for the changed value shall be noted in the remark column of both forms. A corresponding entry providing the reason(s) for the change shall also be noted in the appropriate maintenance log.

(2) Non-numerical Entries. When non-numerical entries are appropriate under a column heading; e.g., focus, brightness, intelligibility, or other subjective observations, the nominal entry shall be a checkmark (Ö). The checkmark will be preprinted on the form or shall be entered manually as each sheet is started.

k. Line Entries. Line entries are observed values of the operating data being recorded. Lines shall not be left blank to separate successive entries.

(1) Numerical Entries.

(a) Enter the as-found parameter value in the appropriate column.

(b) If the as-found value is beyond the operating tolerance or limit, circle the value to note an out-of-tolerance condition. When corrected, record the as-corrected value on the same line in the remark column or on the next line.

(c) Any adjustment made to correct an out-of-tolerance condition may affect previous data entries. If this occurs, those parameters shall be re-measured and the new values recorded in the remark section or next line.

(2) Non-numerical Entries.

(a) When a non-numerical parameter is satisfactory, enter a checkmark (Ö) in the appropriate column.

(b) When a non-numerical parameter is unsatisfactory, enter a circled "(X)" in the appropriate column. The parameter correction should be noted in the remark section or next line.

l. Remarks Entries.

(1) When a parameter is found to be unsatisfactory, a brief explanation

shall be provided in the remark column. If corrective action must be delayed, this shall also be noted in the remark column.

(2) A notation in the remark column of the technical performance record form is not a substitute for a required entry in the maintenance log. If appropriate, the entry on the form may reference the more complete entry in the maintenance log.

m. Initials. The system specialists shall initial each line of data as it is entered.

n. TPR Supervisory Review. Where TPRs are required, they shall be reviewed on an annual basis and upon completion or termination of the page. SMO managers shall designate TPR review authority. System Specialists responsible for routine maintenance activities shall not be assigned to review TPRs. Entries shall be reviewed for accuracy and adverse trends. The reviewing authority shall sign and date the next blank line on the TPR to indicate review. When the form is completed or terminated, the reviewing authority shall sign and date the TPR review block and post a log entry. Regions may increase the frequency of TPR review.

o. Termination. TPRs shall be terminated when a nominal value or standard/tolerance value is changed, or when a new form is started. Void blank lines in the TPR by placing a diagonal line through them.

p. Disposition. The forms shall be retained as specified in Order 1350.15, Records Organization, Transfer, and Destruction Standards.

223. AUTOMATED PERFORMANCE MONITORING.

With the advent of remote maintenance monitoring (RMM), certain facility and status data will be presented via an automated system. Such data provides an indication of facility performance and may form the basis for facility certification.

a. Automated Presentation of Alarms. Facility alarm data presented automatically does not become a matter of permanent record unless facility performance deterioration or a status alarm requiring remedial action is indicated. In those cases, the first AF employee to become aware of the deteriorated condition or alarm shall initiate follow-up action. The incident and activities associated with it shall be entered in the maintenance log for the facility.

b. Data Retention. Some facilities continually generate printouts or files of monitored data, such as ARTS II and III, second-generation VORTAC, etc. One copy of the printouts will be kept where they are generated for 30 days. Maintenance log entries or TPRs may reference copies of these printouts (or the originals) as needed, but this practice should be limited to extreme cases. (The first-level supervisor or designee is responsible for making sure copies of printouts are available and properly stored if they are needed longer than one calendar month.) Printouts referenced in a maintenance log or a TPR shall assume the retention criteria of the parent document. Printouts used as TPRs shall be removed from the general flow and retained as such.

c. Periodic Maintenance Call up. Remote site or control point System Specialists shall periodically access and record facility performance data as required in the applicable technical handbooks or orders. The specialist shall make appropriate maintenance log or TPR entries regarding facility performance, status, or certification based on assessment of the call up data.

d. Remote Access. When maintenance actions are performed on an unmanned facility, the person initiating the action is responsible for ensuring a corresponding entry is made in the appropriate maintenance log. This applies specifically in those cases where a facility is accessed by remote terminal; i.e., MDT.

224. FAA FORM 4650-10, WARRANTY FAILURE REPORT.

FAA Form 4650-10 shall be used to report equipment failure or a part thereof under warranty. Completion and submission of this form enables the FAA to obtain a replacement at contractor cost and a failure analysis on high-failure items. The form is used to minimize parts replacement costs. Order 4650.20, Reporting and Replacement of Items Failing Under Warranty, provides detailed guidance on the preparation and use of FAA Form 4650-10.

225. FAA FORM 6032-1, AIRWAY FACILITIES MODIFICATIONS RECORD.

FAA Form 6032-1 documents the addition or removal of all currently authorized modifications to systems, equipment, and related instruction books in the NAS. The form shall accompany the equipment through its full life cycle. The entries on this form constitute an official record of the modification status of a system or equipment, it shall be kept current and accurate. Order 6032.1, Modification to Ground Facilities, Systems, and Equipment in the National Airspace System, provides guidance on the preparation and use of this form. Organizations may institute automated measures for storage and processing of this data, but a hardcopy printout shall accompany the equipment when moved from that organization.

226. AF MAINTENANCE LOGS.

The FAA uses a variety of logging methods to create a single maintenance log for each facility. The log provides an official historical accounting of status, maintenance activities, and a certification record for the facilities and equipment in the NAS.

227. REVIEW AND ACKNOWLEDGEMENT OF AIR TRAFFIC LOG.

The Daily Record of Facility Operation, FAA Form 7230-4, is completed by AT personnel and is governed by Order 7210.3, Facility Operation and Administration. All AF equipment related entries shall be reviewed by AF personnel under the following guidelines:

a. The review procedure and interval is determined by the responsible AF manager with the concurrence of the responsible AT manager(s).

b. The review may be accomplished via telephone, electronic transfer of data, or in person at the facility.

c. The review shall be documented using the locally approved method.

d. AF shall address all flagged entries in the AT log, and actions taken concerning equipment shall be documented appropriately in the affected AF maintenance log.

228. PERIODIC MAINTENANCE COMPLETION TRACKING.

a. The SMO shall track the percentage of on-time accomplishment of Periodic

Maintenance (PM) tasks scheduled at weekly or longer intervals. The SMO or designee shall review the tracking at least quarterly.

b. The percentage of PM tasks accomplished is calculated by dividing the of tasks completed on-time by the sum of tasks both completed and missed, and multiplying this ratio by 100.

229. MAINTENANCE ALERTS.

The National Operations Control Center (NOCC) provides coordination and management of facility activities for NAS infrastructure services. When events, maintenance activities, or logistic support have the potential to systemically affect NAS operations, the NOCC shall, in partnership with AOS, ANI, ANS, ASR and/or AML, generate Maintenance Alerts utilizing electronic technologies to heighten the awareness of the AF community. The intent of the Maintenance Alerts is to quickly notify the AF community of procedural changes, safety awareness, logistic support problems or maintenance activities that may or will impact system users.

SECTION 3. MAINTENANCE LOGS

230. INTRODUCTION.

This section provides the procedures that apply to any logging system. Logging provides a means of documenting equipment performance and maintenance activities, well as providing an official record of site events. It is important to prepare carefully. For instructions on a specific logging system, reference the appropriate logging procedures.

231. MAINTENANCE LOGS.

Each FSEP entity shall have a single electronic maintenance log maintained in accordance with nationally standardized methods with the following qualifications:

a. FSEP entities listed in Appendix 4, Facilities Not Requiring Maintenance Logs, are exempt from this requirement.

b. Classified data shall not be placed into any electronic format.

c. Non-Federal facilities are not required to use electronic logs. Non-Fed facilities shall use the paper log equivalent.

d. SMO managers or their designee may establish other logging requirements as needed.

232. LOG ENTRY AUTHORITY.

Authorization to make log entries shall be made a matter of written record by the SMO manager, the manager's designee, or higher authority; and issued on the basis need, cognizance, and competence.

a. Each employee shall be identified by his/her initials when making log entries.

b. In the event two people at a facility have identical initials, the supervisor shall assign distinctive initials (for logging purposes) to avoid confusion.

c. AF Control Center personnel shall be given log entry authority to make entries of scheduled or unscheduled interruptions of NAS systems, subsystems or services.

d. Log entry authorization for non-FAA personnel shall be restricted to those under contract.

(1) The contractor will provide a list of personnel requesting written log entry authority. The SMO manager will then grant log entry authorization in writing.

(2) Assignment letters shall list, by name, those authorized to make log entries. They may list more than one authorized person. (A notation such as "representative from XYZ Corporation" is not acceptable.)

e. Regional or headquarters FAA personnel, on official business, may make log entries concerning that visit when requested by SMO personnel, without written authorization.

233. ACTIVITIES REQUIRING LOG ENTRIES.

Entries in the logs shall provide a complete historical account of activities related to facility status, certification, operation, or performance. They shall include but are not limited to:

a. Physical arrivals and departures at facilities without permanent staff. At least one entry shall include the purpose of the visit.

b. All system and subsystem interruptions and related activities.

c. Start and completion of periodic or corrective maintenance actions performed.

d. Identification of failed or replaced equipment components.

e. Start and completion of flight inspections if on-site personnel are or notified.

f. Technical evaluations, inspections of any kind, and aircraft accident/incident investigations.

g. Equipment changes, replacement, or adjustment of parameters.

h. Modification, commissioning, or decommissioning activities.

i. Pilferage, vandalism, or related events.

j. Adverse weather effects, commercial power failures, access road problems, any other conditions deemed to have impact on facility or air traffic operation.

k. Certification or decertification of systems, subsystems, or services.

l. Visits by regional, headquarters or non-FAA personnel.

m. Coordination entries concerning facility transfer, intentional channel changes, interruption, refusal of interruption request, or restoration shall state the organizational element and initials of the person contacted; i.e., AFSS (JS), ARTCC (LC), AT (RD).

n. Supervisory log reviews.

o. Start and completion of radio frequency interference investigation if on-site personnel are involved.

p. Unsolicited statements from cognizant personnel about facility operations.

234. LOG ENTRY CHARACTERISTICS.

The log is a factual and chronological documentation of events. Log entries shall comply with the following requirements:

a. Content shall be accurate, complete, clear, concise, and entered in a manner. Elaborate details and opinions shall be avoided. The use of approved contractions and reference to substantive records and directives should be used when describing maintenance activities. The following references provide approved word and phrase contractions:

(1) Order 1375.4, Standard Data Elements and Codes—Facility Identification and Supplemental Standards.

(2) Order 6000.5, Facility, Service, and Equipment Profile.

(3) Order 7340.1, Contractions.

(4) NAS MD-001, National Airspace System Configuration Management Document.

b. All entries shall be date and time stamped using Coordinated Universal Time (UTC.)

c. Content shall correlate with related data on other forms, records, and reports.

d. Entries shall cite the appropriate instruction books, maintenance directives, maintenance charts, or other documents when appropriate.

e. Erroneous entries shall be voided or corrected, not erased or deleted.

f. Certification statements shall be entered as specified in the maintenance handbooks. Certification entries shall be made by a single party.

g. Multiple certification entries on similar equipment may use an inclusive statement. For example, "all" (or a partial list) of the communication frequencies at a facility may be certified with a single entry, in lieu of listing the separate frequencies.

h. A certification entry, if required, shall precede a "return to service"

entry in conjunction with a facility restoration entry.

i. Each log entry, change, or void shall contain the initials of the person making the entry.

j. All unsolicited statements regarding facility operations or status made by Flight Inspection, or other organizational representatives, (FAA or non-FAA), shall be entered into the log by designated personnel only.

k. Those persons shall identify the source of the statement by including last name and organization. The name of the person in charge of the project, for facility work projects, shall be noted. Any known effects of the project on facility operation or status shall be included in the entry.

235. LOG REVIEW.

Maintenance logs shall be subjected to three levels of review: immediate, supervisory, and administrative.

a. Immediate Review. Personnel making log entries shall review each entry for compliance with logging requirements before initialing.

b. Supervisory Review. The site supervisor or designee shall conduct a log overview. The review frequency shall be determined by the SMO manager or designee, but shall be at least annually. This review shall address:

(1) Detection of facility performance trends and recurring malfunctions.

(2) Log procedural or policy discrepancies.

(3) Technical completeness.

(a) Noted logging discrepancies shall be brought to the attention of the person making the entry in the interest of corrective instruction.

(b) Mistakes or unclear entries shall be corrected by an additional entry referenced to the erroneous entry by date and time. (Deletions are not allowed.)

c. Administrative Review. The SMO manager or designee shall conduct administrative log reviews. Reviews at this level are intended to detect facility performance deterioration trends and recurring malfunctions. During these reviews, no deletions, corrections, or additions to previous entries are permitted. Errors at this level will be brought to the attention of the first-level supervisor for the prevention of similar future errors.

236. DISPOSITION OF LOGS.

a. The retention period shall be a minimum of 2 and a maximum of 3 years after the log entry date; destruction after 2 years is preferred. Providing that there are no unresolved claims against the Government with regard to the facility involved, all log copies shall be destroyed after 3 years.

b. Classified logs shall be transferred to the regional office for destruction in accordance with Order 1600.2, Safeguarding Controls and Procedures for Classified National Security Information and Sensitive Unclassified Information.

c. Logs shall be destroyed at the office or facility of concern, except for classified or aircraft accident logs. Storage and destruction of maintenance logs shall be in accordance with Orders 1350.15 and 1370.82, Information Systems Security Program.

d. Non-FAA entities shall not be provided copies or access to facility logs without prior approval from the Region or the Washington office.

237.-299. RESERVED.

CHAPTER 3. MAINTENANCE REQUIREMENTS

SECTION 1. TECHNICAL COGNIZANCE REQUIREMENTS

300. INTRODUCTION.

This section summarizes the technical aspects of the AF maintenance program for operational facilities in the NAS. Each AF employee is charged with the responsibility of providing support for the operational activities of the NAS.

301. MAINTENANCE FAMILIARIZATION.

All personnel engaged in AF maintenance activities shall familiarize themselves AF policy, general philosophy, and procedures, particularly those having a direct bearing on the areas of specialty, facilities, or systems involved, including but not limited to the following:

a. System Knowledge. Being aware of the function of each facility performs in the NAS. Personnel should familiarize themselves with the local airspace to understand how a given facility will impact air traffic operations within that airspace.

b. Equipment Characteristics. Operational characteristics including:

(1) Technical standards and procedures as published in appropriate maintenance handbooks and equipment instruction books.

(2) Technical performance record data.

(3) Commissioning data.

(4) Applicable equipment warranties.

(5) Integrated Logistics Support Plan (ILSP).

(6) Ground check data.

(7) Flight inspection data.

(8) Use and care of test equipment.

c. Safety. Published precautions and procedures applicable to maintenance activities. See chapter 6 of this order.

d. NAS Change Proposal (NCP). Configuration control of approved changes to equipment, subsystem, system, or facility.

e. Documentation. Consisting of technical documentation applicable to the system, subsystem, equipment, or facility maintenance activities.

f. Coordination. Know the procedures for coordination with FAA and non-FAA personnel.

302. STANDARDS AND TOLERANCES/LIMITS.

Technical performance of NAS systems is characterized by performance parameters, some of which are considered critical indicators of proper system operation and are designated as key performance parameters; e.g., output voltage is key for a power supply. Key performance parameters are identified in the standards and tolerances chapter of the maintenance handbooks by an arrow placed to the left of the applicable item.

a. Adjust-and-Maintain Value. Each performance parameter has a maintenance standard that is the optimum value from a system engineering viewpoint. Tolerances/limits around that value are defined.

b. Monitor Alarm Value. Some parameters are so important that they are monitored by a shutdown function and have standard values with tolerances/limits around that value defined.

c. Pre-Alarm Value. Some parameters may have alarms set to provide an indication that they are approaching an out-of-tolerance condition. These are commonly referenced as soft alarms or maintenance alerts, and have standard values with tolerances/limits defined.

d. Tolerances and Limits. If defined, each standard value has been assigned an "initial" and an "operating" tolerance/limit expressed in terms of permissible deviation from the standard, or in absolute maximum or minimum performance levels, as appropriate, for use during maintenance and certification activities

e. Source of Standards and Tolerances. Equipment standards are normally found in the maintenance handbooks but may be listed in the individual instruction books. The standards and tolerances are based on system performance requirements, manufacturer specifications, and use of standard test equipment. If discrepancies exist between the standards and tolerances listed in maintenance handbooks and individual instruction books, the maintenance handbook shall take precedence.

f. Adjustment of Performance Parameters. Parameters may be adjusted to or shall be adjusted to correct out-of-tolerance operation.

(1) To avoid the unnecessary expenditure of manpower, repairs or adjustments should not be made solely because a particular reading is not exactly the same as the standard value. Adjustments are required only if one or more of the performance parameters, listed in the appropriate maintenance handbook or manufacturer's instruction book, meet(s) any one of the following conditions:

(a) If a performance parameter exceeds its operating tolerance/limit.

(b) If, in the opinion of the person making the measurement, a facility, system, or equipment failure may occur prior to the next scheduled maintenance activity if the adjustment is not made.

(c) If NAS operations are being degraded.

(2) If corrective action is performed, the action shall result in the affected parameter(s) being adjusted to within the specified operating tolerance/limit as a minimum, and to within the specified initial tolerance/limit to the extent practical. In addition, whenever adjustments are made to alleviate an out-of-tolerance/limit condition, the System Specialist shall verify that the corrective adjustments have not affected the within-tolerance/limit operation of other parameters. If certification parameters have been affected, certification is required.

g. Philosophy of Standards. Where system, subsystem, or equipment parameters are monitored, the monitors alarm standards and tolerances/limits for the parameters often differ from the adjust-and-maintain or maintenance standards and tolerances/limits for the same parameters.

(1) The maintenance tolerances/limits are considered quality-control type requirements, and exceeding these tolerances/limits will usually not endanger the user. The monitor alarm tolerances/limits are the values beyond which conditions may be unsafe. Therefore, maintenance standards and tolerances/limits are generally more stringent than monitor alarm standards and tolerances/limits for the same parameter. This relationship provides an early warning for action on system performance derogation situations.

(2) For example, the operating tolerance/limit for a transmitter power output may be "less than 40 percent reduction" from the specified standard value, whereas the monitor alarm point may be a 50 percent reduction from the specified standard value. Thus, if the transmitter power output is found to have deteriorated 45 percent from the standard value, corrective maintenance action would be required, but the monitor would not have alarmed, and no shutdown would have occurred.

303. MINOR EQUIPMENT ADJUSTMENTS.

Minor adjustments to operating equipment may be performed without removing the equipment from service, provided the adjustments will not place any parameters beyond published operating tolerances/limits, or cause confusing or disturbing indications to aircraft or controllers, or cause an interruption to the service being provided. For example, a maintenance handbook may authorize a temporary reduction of power output to check the power monitor alarm, provided the power output is not reduced below operating tolerance for the power monitor, and a momentary change of alarm status is not indicated at the control point.

304. PRIME DIRECTIVE.

Maximum availability is of prime importance to the users of the NAS. Accordingly, equipment downtime shall be kept to a minimum. Coordination with the appropriate AF Control Center before shutdown of equipment and prompt reporting of interruptions are equally important. This minimizes the impact of a facility or service loss in the air traffic environment.

305. LIAISON RESPONSIBILITIES.

Airway Facilities personnel shall be cognizant of the interaction between their

duties and responsibilities and those of others, both within and outside FAA. A liaison through the office of primary responsibility (OPR) shall be established to ensure the mission of the FAA can be accomplished in a timely, efficient, and effective manner with those indicated below:

a. Air Traffic Personnel. The appropriate AF Control Center shall coordinate all maintenance activities that may adversely affect the service provided by a commissioned facility with AT personnel in advance. A Notice to Airmen (NOTAM) will be issued when required in accordance with Order 7930.2, Notices to Airmen (NOTAMS). Some conditions requiring close coordination with AT personnel are described below.

(1) Whenever performing any operation where an interruption would be observed by a user; e.g., a change of transmitters, AF personnel shall not start their activities until the appropriate air traffic control facility concerned has been notified and approved the release.

(2) Immediately upon equipment failure or upon notification that a facility is out-of-service because of equipment failure.

(3) When transferring the facility to standby power.

(4) Whenever service can be restored after an interruption of a system, subsystem, or equipment.

(5) When construction or modernization may cause interruptions.

(6) When the certification has been removed, or the maximum certification interval has been exceeded.

b. Other Airway Facilities Personnel. The appropriate AF Control Center shall coordinate all maintenance activities that may adversely affect other AF facilities.

c. Flight Inspection Personnel. AF personnel may be required to work with Flight Inspection personnel during flight inspections.

d. Other Government Agencies. AF personnel shall coordinate activities with other Government agencies, in accordance with FAA directives or formal agreements.

e. Local Authorities. AF personnel shall cooperate with local government authorities (including airport, fire and police officials) in areas appropriate to the FAA mission and in the performance of their assigned duties in particular.

f. Telephone Companies. AF personnel shall coordinate their activities with appropriate telephone company personnel to expedite tests and repairs of telephone lines and equipment.

306. OPERATIONAL STATUS, NOTICES TO AIRMEN (NOTAM).

Air Traffic personnel are responsible for initiation and dissemination of NOTAMs shall be kept informed of the current operational status of all systems, facilities, and equipment. Any interruption or change in the performance characteristics that would, in the judgment of the System Specialist, adversely affect service to the user shall be reported to AT personnel for possible NOTAM or other appropriate AT action. Appropriate security precautions shall be taken when reporting any change to operational status of joint-use radars. The SMO manager or designee shall review NOTAMs and the Airman's Information Manual to determine

whether facility status is properly reported and correctly described. The manager the appropriate AT facility shall be notified immediately of any discrepancy so appropriate action may be taken.

307. REMOVAL OF IDENTIFICATION.

On those systems having identification signals, the identification signal shall be removed during any maintenance activities that may affect system operation. This signifies to the user that equipment adjustments are being accomplished and the system may be unreliable.

308. ORDER OF RESTORATION ACTIVITIES.

Restoration activities shall be accomplished in the following order:

a. Corrective maintenance, if necessary, of the facility providing the

b. Certification or verification, as required, of the facility or service.

c. Notification of the appropriate points of contact that the facility or service is restored.

309. SIGNIFICANT EVENT REPORTING.

a. A significant event is any event causing an impact to air traffic operation or that may cause a facility/service interruption at airports, centers, and other FAA facilities.

b. A Significant Event Report (SER) shall be submitted by the SSC manager in accordance with Order 6030.41, Notification Plan for Unscheduled Facility and Service Interruptions and Other Significant Events.

310. REPAIR OF SYSTEMS OR EQUIPMENT.

As equipment becomes more modular and complex, it is often more cost effective, timely, and efficient to restore systems/equipment by replacing modules rather than replacing components.

311. MODULE REPAIR PHILOSOPHY.

Airway Facilities philosophy is to repair modules at the field level, whenever cost effective, practical and not prohibited, and in coordination with the FAA Logistics Center. This applies to both expendable and Exchange and Repair (E&R) items. Expendable items are not to be automatically discarded without attempting repairs, even though the initial cost of the items is minimal. The designation of item as E&R does not preclude on-site repair if a local repair effort is determined to be feasible.

312. REPAIR DECISIONS.

The SMO manager shall ensure that field repairable equipment is not sent to a servicing depot for repair.

a. Factors that may make field repair impractical include:

(1) The unavailability of special tools and equipment.

(2) The extent of the training the System Specialist has received, and the time required to effect repairs.

(3) The availability of depot or other outside repair facilities.

b. If depot repair is required the item shall be sent to the appropriate servicing depot within 15 days.

313. REPAIR METHODS.

a. The following methods are available for items that can be repaired:

(1) Repair by warranty. AF personnel shall not attempt to repair items under warranty unless required to return a critically needed facility to service. In this case, field repair of failed printed-circuit boards in equipment under warranty may be made where the technical capability exists to isolate the fault and effect repairs. Failed or defective component parts on printed-circuit boards shall be reported in accordance with Order 4650.20, Reporting and Replacement of Items Failing Under Warranty. Where repairs exceed the technical capability of field personnel, the printed-circuit board itself shall be reported as failed, per Order 4650.20, and a replacement requisitioned from the servicing depot. e.g. FAALC or contractor depot.

(2) Repair on-site by System Specialist using parts from station stock, local purchase, or requisitioned from the FAA Logistics Center.

(3) First, repair using local vendors with current repair contracts. Second, use local vendors without a current contract where economically feasible,

(4) Repair at the depot using Repair & Return (R&R), or Exchange & Repair (E&R) methods. All items returned to the FAA Logistics Center for E&R or R&R shall be accompanied by an Airway Facilities Modification Record (FAA Form 6032-1) or an approved electronic equivalent. A sufficiently detailed description of defects, problems, and repairs attempted shall be included to provide depot personnel necessary information to restore the item.

b. Items that cannot be repaired by any of the above methods will be replaced.

314. LOGISTICS REQUIREMENTS.

Before a new system, subsystem, or equipment is introduced into the NAS, AF shall assist the requirements, acquisition, and logistics organizations in developing lifecycle support plans that include at least the following:

a. Maintenance planning.

b. Maintenance staffing.

c. Maintenance support facilities.

d. Packaging, handling, storage transportation and disposal.

e. Supply support.

f. Support equipment.

g. Technical data.

h. Training.

315. PROVISIONING.

The NAS Operations office develops the maintenance program in support of the stated operational requirements of the system. Through coordination with the FAA Logistics Center (depot) throughout the provisioning cycle, and by participation in provisioning conferences, the NAS Operations office endeavors to ensure adequate timely depot and on-site support of all systems, subsystems, and equipment as they are introduced.

316. SUPPLY SUPPORT.

The FAA Logistics Center is responsible for providing logistical support to meet operational requirements of any system used in the NAS.

a. Some selected NAS plan projects provide Contractor Depot Logistics Support (CDLS). Initial spares and other provisions are determined individually for each system as part of the National Airspace Integrated Logistic Support (NAILS) process. Subsequent supply requirements, as they develop, are furnished upon demand by submission of a requisition to the depot in accordance with Order 4250.9, Field Material Management and Control. Field logistic operations such as Exchange and Repair (E&R), Repair and Return (R&R), packing, marking and shipping, inventory control, and replenishment are covered in Order 4250.9.

b. AF personnel shall keep an accurate inventory of site spares.

317. COMMISSIONING.

Commissioning is the formal incorporation of a new facility, system, subsystem, or equipment into the NAS. The ultimate determination that the facility, system, subsystem, or equipment will be commissioned for service shall be dependent upon technical performance of the electronic and/or plant equipment, the results of flight inspection, and the attainment of the required operational service. A facility, system, subsystem, or equipment shall be commissioned only after the following actions have been completed:

a. The joint acceptance board members have determined the conditions of acceptability in accordance with established standards and specifications and signed the JAI report for their respective offices.

b. Certification, if required, and commissioning statements have been entered in the appropriate maintenance log by responsible AF SMO personnel.

c. Flight inspection, when required, has evaluated the operation of the facility and issued any required restrictive NOTAM.

d. Standard Instrument Approach Procedures (SIAP) have been developed by Aviation System Standards office (AVN) if required.

e. The commissioning NOTAM has been issued, if required.

f. The FRDF has been established and includes all applicable NCPs/CCDs, technical reference data documentation, and reference materials.

g. A change to the FSEP has been initiated, where required, to place the facility in a commissioned status. The facility may be commissioned if the action has been initiated even if the FSEP action has not been completed.

h. For commissioning procedures reference Order 6000.50, Airway Facilities National Airspace System Operations Handbook.

318. DECOMMISSIONING.

Decommissioning is the permanent removal of a facility, system, subsystem, or equipment from service in the NAS. The actions outlined below are required for facility decommissioning and associated service terminations. The regional AF division or the AF SMO, if so designated, shall:

a. Coordinate with AT to begin their decommissioning activities.

b. Ensure the National Flight Data Center (NFDC) has been notified of the proposed decommissioning at least 90 days prior to the actual decommissioning.

c. Verify with the regional Flight Standards division that action has been initiated to cancel or amend the SIAP, predicated on the facility to be decommissioned.

d. Initiate action, as required, for termination of leased telecommunication services and frequency assignment.

e. Initiate FSEP changes, as required.

f. Initiate actions, as required, to terminate property leases and utility contracts.

g. Redistribute, declare excess, or return to the FAA Logistics Center, as appropriate, all real and personal property, facility maintenance and operating supplies, and materiel in accordance with Orders 4660.1, Real Property Handbook and 4800.2, Utilization and Disposal of Excess and Surplus Personal Property.

h. Provide for restoration of facility site, including environmental restoration, as needed.

i. Take action to transfer, store, or dispose of facility records and reference materials in accordance with Order 1350.14, Records Management.

j. Terminate any open procurement requests.

k. Ensure that the decommissioning NOTAM has been issued, if required.

319. AUTOMATED LOGGING SYSTEMS.

a. AF's automated record keeping capabilities have evolved over many years. Maintenance Management System (MMS) is the automation tool used by AF. A new graphical user interface is provided by using Simplified Automated Logging (SAL). SAL does not contain the same functionality as MMS but rather a simplified subset of functions.

b. The System Specialist should remain aware that in addition to completion of logging responsibilities for a particular event, there might be reporting requirements for the same event. AF Logging policies and procedures are contained in this order and Order 6000.48, while AF reporting policies and procedures are contained in Order 6040.15, National Airspace Performance Reporting System.

SECTION 2. FACILITY MAINTENANCE REQUIREMENTS

320. INTRODUCTION.

This section covers Airway Facilities maintenance activities, which are both periodic and corrective in nature. They are intended to ensure accuracy, integrity, continuity, and availability to promote system safety. All maintenance shall be performed with minimum interference to facility operation.

321. PERIODIC MAINTENANCE.

Periodic Maintenance (PM) consists of preventive maintenance inspections, performance checks, and routine maintenance.

a. Preventive Maintenance consists of activities that are accomplished on a scheduled or as-required basis in accordance with technical directives and instruction manuals.

b. Performance Checks confirm the operating status of the equipment at a given time.

c. Routine Maintenance consists of tasks not identified in maintenance handbooks.

322. CORRECTIVE MAINTENANCE.

Corrective maintenance is maintenance performed to identify or correct a problem. consists of activities performed when reacting to an interruption of a system, subsystem, equipment, or service. However, it is not restricted to events following an interruption. Corrective maintenance includes fault detection, troubleshooting, fault isolation, and replacement of any failed components.

323. SCHEDULES.

a. Scheduling. Periodic maintenance activities shall be scheduled in with equipment maintenance handbooks or manufacturer technical instruction books. A basic recurring periodic maintenance schedule shall be established including all required tasks.

Figure 3-1. PM Accomplishment Windows.

	Window Within the Interval		
Recurring		Time on Each Side of	

PM Interval	Due	Due Date	Total Window Length
Daily	1	± 0 Days =	1 Day
Semi-	1	± 1 Days =	3 Days
Weekly	1	± 3 Days =	7 Days
Bi-Weekly	1	± 3 Days =	7 Days
Monthly	1	± 7 Days =	15 Days
Bi-Monthly	1	± 7 Days =	15 Days
Quarterly	1	± 15 Days =	31 Days
Semi-	1	± 30 Days =	61 Days
Annual	1	± 45 Days =	91 Days
2 Year	1	± 90 Days =	181 Days
3 Year	1	± 120 Days =	241 Days
5 Year	1	± 120 Days =	241 Days
8 Year	1	± 120 Days =	241 Days
12 Year	1	± 120 Days =	241 Days

b. Periodic. Scheduled PM due dates for recurring PM tasks are based on the number of days between task accomplishment. This time is called the interval. Specific values for each interval are found in Appendix 1. A window within each interval defines the period in which PM accomplishment is considered on-time. The window is centered on the task due date. Windows for daily intervals equal the entire interval. Intervals and associated windows are shown in Figure 3-1.

c. Consistency. Periodic maintenance tasks shall be performed as close as possible to the actual scheduled date.

d. Late or Missed PMs. If a periodic maintenance task cannot be performed within the specified interval it shall be performed at the earliest possible date, and is considered late or missed.

(1) Late PMs are those performed after the scheduled window, but prior to the next regularly scheduled window. The basic periodic maintenance schedule shall not be adjusted when tasks are performed outside of their scheduled window.

(2) Missed PMs are those not accomplished prior to the next scheduled window.

e. PM Requirements. PM requirements and intervals are derived from the following documents in the order listed:

(1) FAA Maintenance Handbooks. Periodic maintenance tasks identified are the basic requirements.

(2) FAA Regional Maintenance Orders and Supplements. These may identify additional PM required or shorten the intervals defined in national orders.

(3) FAA Technical Instruction Books. PM identified will be performed if a national/regional maintenance order does not exist or fails to identify periodic requirements.

(4) Manufacturer Instruction Books. PM identified will be performed if

guidance from the previous three documents does not exist.

f. Adaptability. PM may be accomplished at more frequent intervals than published due to operational or environmental conditions.

324. MODIFICATIONS TO FACILITIES, SYSTEMS, SUBSYSTEMS, AND EQUIPMENT.

Requests for approval of modifications to items under Configuration Management (CM) shall be submitted in accordance with Order 1800.8. Requests for approval of modifications to items not under configuration management shall be submitted in accordance with Order 6032.1, Modification to Ground Facilities, Systems, and Equipment in the National Airspace System.

a. Modifications to ground facilities, systems, subsystems, equipment, including associated monitor and test equipment, structures, and buildings, shall be authorized only to correct deficiencies, satisfy changing requirements, improve performance, increase reliability, minimize or eliminate safety hazards, reduce manpower requirements, facilitate maintenance, save money, or enable commissioning.

b. Changes to established baselines of installed systems require NCP and approval by the appropriate Configuration Control Board (CCB) before the change may be installed. Emergency modifications may be verbally authorized but shall be documented within five days of approval by submittal of an NCP.

c. Authorized modifications shall be considered priority projects and shall be accomplished within the required timeframe in accordance with AOS.

d. Temporary modifications shall be removed as soon as practical.

e. Unauthorized modifications are expressly prohibited. If unauthorized modifications are found they shall be reported promptly to the supervisor for removal or proper authorization.

f. Guidance on FAA modification policy and procedures is contained in Orders 1800.8, and 6032.1.

325. NONSTANDARD MAINTENANCE PROCEDURES.

When conditions preclude maintenance according to established criteria or procedures, the cognizant SMO shall initiate a notification to the 2nd level engineering support activity and the cognizant Configuration Control Board (CCB). The notification shall include all pertinent information such as the reason(s) for nonstandard maintenance, problems encountered or anticipated, etc. If any hardware, software, or documentation under configuration management is required to be modified, a NAS Change Proposal (NCP) shall be processed according to procedures in Order 1800.8, with accompanying FAA Form 1800-2.

326. MOBILE FACILITIES PROGRAM.

The FAA requires adequate mobile units to meet the following requirements:

a. Emergency or special event requirements.

b. Replacing facilities destroyed by natural or manmade disasters.

c. Supporting scheduled maintenance and modernization programs.

d. Establishing temporary service at locations qualifying for facilities where lack of a facility would adversely affect flight safety.

327. MANAGEMENT OF MOBILE FACILITIES.

The Aeronautical Center is the OPR for the management of the mobile facility program.

a. Order 6030.18, Mobile Air Traffic Control, Navigational Aid, Communication and Power System, and Order 6480.2, Maintenance Of Mobile Air Traffic Control Towers provide more detailed information relative to the overall program management of mobile facilities.

b. Maintenance of Mobile Facilities. Maintenance of mobile facilities is the responsibility of the organizational element having custody. AF personnel shall be cognizant of their duties and responsibilities in the deployment, installation, maintenance, and operation of mobile air traffic control, navigational aids, communications, and power systems. Detailed guidance is contained in Order 6030.18 and Order 6700.16, Maintenance of Mobile VHF Omnirange (VOR) Facilities, and individual maintenance handbooks.

328. MAINTENANCE OF AIR TRAFFIC TRAINING EQUIPMENT.

The AF organization will cooperate to the extent practical in maintaining approved training aids, both electronic and mechanical, used by AT personnel at field locations such as ATCT, ARTCC, and FSS/AFSS facilities. The Washington AF headquarters and/or regional offices will issue directives and procedures covering specific items of equipment.

329. MAINTENANCE OF JOINT-USE MILITARY EQUIPMENT.

The joint use of military facilities is governed by Order AF 6430.49, Ground Rules for Air Defense Command and CAA Joint Use of Radar Facilities, and the approved agreements of the Joint Radar Planning Group (JRPG) meetings. The FAA AF Washington office will, when required, issue directives to its field organizations to FAA JRPG commitments.

SECTION 3. OTHER MAINTENANCE REQUIREMENTS

330. INTRODUCTION.

This section covers additional maintenance activities that may not be identified in other maintenance handbooks. All maintenance shall be performed with minimum interference to facility operation.

331. OVERSIGHT REQUIREMENTS.

The FAA requirement is to ensure that all facilities used in the NAS regardless of ownership or maintenance responsibility shall be maintained to provide the same level of service.

a. Areas of FAA oversight on non-FAA maintained systems include:

(1) Oversight for contractor maintained systems. This shall be in

accordance with Order 6000.41, Policy Governing Contractor-Assisted Maintenance for the National Airspace System.

(2) Oversight of Non-Fed facilities. This shall be in accordance with Order 6700.20.

(3) Oversight of facilities with military responsibility for maintenance. This shall be in accordance with Order 6000.6, United States Interagency Ground Inspection Manual for Air Traffic Control and Navigational Aids Facilities.

b. Oversight covers topics such as maintenance practices, configuration management, periodic technical evaluation, personnel evaluation, and test equipment calibration standards traceability.

332. HEADQUARTERS REQUIREMENTS.

The appropriate divisions in Washington AF headquarters shall provide for training, arrange for procurement and the repair of test equipment, and furnish necessary documentation, including directives, as required for all programs.

333. REGIONAL REQUIREMENTS.

The regions shall ensure field repair capabilities are established and the policies and procedures of this order are implemented.

a. Test equipment at the facility is provided in accordance with standards established by Order 6200.4, Test Equipment Management Handbook.

b. Adequate working equipment shall be available at the facility, in with standards established by Order 4630.2, Standard Allowance of Supplies and Working Equipment for National Airspace System Facilities.

c. A site stock of replacement parts and components should be available at the facility in accordance with Order 4620.3, Initial Support for New or Modified Equipment Installation.

d. Personnel training is scheduled in accordance with established training programs, and as directed by Order 3400.3, Airways Facilities Maintenance Personnel Certification Program.

334. TEST EQUIPMENT.

Test equipment shall be maintained in proper operating condition. General regarding calibration and repair of test equipment are contained in Order 6200.4.

335. MAINTENANCE OF RADIO FREQUENCY (RF) CABLES AND CONNECTORS.

Unless specified otherwise in applicable documents, RF cables, connectors and terminations shall be inspected, and repaired, if required, at least annually at facilities in the NAS. Schedules shall be established based on local conditions. Moisture proofing shall be accomplished after all maintenance or when there may be possible or potential moisture problem. Reference Chapter 4, Paragraph 445, for moisture-proofing procedures.

336. MAINTENANCE OF NONCOMMISSIONED FACILITIES, SYSTEMS, SUBSYSTEMS, AND EQUIPMENT.

During tests, modernization, relocations, and operational readiness demonstrations, when a noncommissioned status exists on the airway facility, subsystems, and concerned:

a. Such equipment shall be maintained to the standards of commissioned equipment to the extent practical to prevent derogation of quality and capability.

b. The facility, system, subsystem, or equipment may be removed from service any time without a NOTAM; however, prior coordination with AT personnel may be appropriate.

c. Identification signals shall not be broadcast by a noncommissioned except for the specific identification "TEST."

d. Custodial maintenance shall be performed to the extent practical and as the workload permits.

337. AIRCRAFT ACCIDENT ACTION.

a. The data on technical performance record forms and maintenance logs are of prime concern and legal importance during aircraft accident investigations. Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting, contains detailed instructions on the responsibilities of AF personnel in the event of an aircraft accident/incident. 6000.48 contains detailed instructions on maintenance log entries for aircraft accidents.

b. Order 8020.11 and its supplements, or any displacing regional directive, shall be maintained in a plainly marked document, prepared in advance, and readily available to facility personnel when needed.

338. PRESERVATION OF NATIONAL ENVIRONMENT AND RESOURCES.

Airway Facilities personnel, in accordance with applicable laws and regulations, shall ensure that all maintenance operations promote the prevention, control and abatement of air and water pollution. AF personnel shall use techniques for the disposal or discharge of waste and radioactivity that are consistent with the national effort. Order 1050.10, Prevention, Control, and Abatement of Environmental Pollution at FAA Facilities, outlines the basic FAA policies, plans, and responsibilities that will enable the FAA to fulfill its obligations in this area.

339. EQUIPMENT WARRANTIES.

a. Background. Some new equipment introduced into the NAS is covered by a warranty (or guarantee) clause. The terms of the warranty can usually be found in the forepart of the equipment instruction book. Warranties on such equipment normally run for two years from the date of factory acceptance or one year from the date of first use by FAA, whichever occurs first. Items of test equipment are normally covered by a commercial warranty. The terms and duration of commercial warranties vary between individual manufacturers. Some items furnished through the FAA Logistics Center, such as vacuum tubes, may also be warranted, and the warranty information is often printed on the item itself. In other cases of warranted items furnished by the depot, warranty information is printed on the shipping container.

b. Action Required. Airway Facilities personnel shall identify items and equipment under their purview that are in warranty and comply with the provisions of Order 4650.20. Failure to report failures, which occur during the warranty period, may affect FAA's entitlement for repair or replacement by the contractor or

manufacturer and may also mask design deficiencies.

SECTION 4. TECHNICAL EVALUATIONS AND INSPECTIONS

340. INTRODUCTION.

This section explains the types of evaluations and inspections, that provide a quality assurance function on NAS facilities.

341. TYPES OF EVALUATIONS AND INSPECTIONS.

AF personnel conduct inspections to assure the quality of system performance in the NAS. Several types are:

a. Routine.

b. NAS Technical Evaluation Program (NASTEP).

c. Acceptance inspections.

d. Flight inspections.

e. Safety inspections.

342. ROUTINE INSPECTIONS.

System Specialists, and others engaged in routine maintenance activities, are required to inspect system, subsystem, and equipment performance according to appropriate maintenance handbooks.

343. NAS TECHNICAL EVALUATION PROGRAM (NASTEP).

a. The NASTEP contained in Order 6040.6, Airway Facilities NAS Technical Evaluation Program, is the main component in the overall evaluation of AF maintenance activities.

b. NASTEP provides the following:

(1) Periodic independent technical review of services provided by system, subsystem, and equipment.

(2) Review of how well the services match customer needs.

(3) On-site in-depth technical inspections by NASTEP evaluators including review of:

(a) Maintenance logs.

(b) Technical performance records.

(c) Facility Reference Data File (FRDF).

(d) Required maintenance handbooks.

(e) Aircraft accident reporting procedures.

(f) Certification intervals.

(g) Certification and key performance parameters.

344. ACCEPTANCE INSPECTIONS.

Projects to establish, relocate, and improve NAS facilities require a Joint Acceptance Inspection (JAI) and may require a Contractor Acceptance Inspection (CAI). These inspections are conducted to ensure facility projects are completed in accordance with project specifications and facility performance is within established standards and tolerances. Representatives of the AF, Logistics, Flight Standards, and AT organizations, as appropriate, participate in these inspections. Refer to Order 6030.45, Facility Reference Data File for detailed requirements on conducting a JAI or CAI.

345. FLIGHT INSPECTIONS.

Many NAS facilities have performance characteristics that can only be measured or validated by airborne measurements. The FAA maintains a fleet of flight inspection aircraft, specially equipped with high quality avionics equipment and position-determining systems, to make these measurements. Most flight inspection activities occur on a periodic basis throughout the lifetime of a facility; commissioning and special inspections are also conducted. Details on the scheduling and conduct of flight inspections are published in Order OA P 8200.1, United States Standard Inspection Manual, and in Chapter 4 of this order.

346. SAFETY INSPECTIONS

a. Annual safety inspections of FAA facilities are required in accordance with the latest version of Order 3900.19, Occupational Safety and Health Program.

b. Safety inspections are conducted in accordance with Occupational Safety and Health Administration (OSHA) regulations and Order 3900.32, Agency Compliance with Occupational Safety and Health Administration Standards: APM National Abatement Plan, to provide a safe working environment.

347.-399. RESERVED.

CHAPTER 4. MAINTENANCE PROCEDURES

SECTION 1. PROCEDURES FOR UNSCHEDULED FACILITY INTERRUPTIONS

400. INTRODUCTION.

This section provides guidance and requirements for handling unscheduled facility interruptions and their reporting and restoration activities. AF personnel having firsthand knowledge of an unscheduled interruption shall report the incident to the

appropriate AF Control Center.

401. FACILITY RESTORATION.

Upon discovery or notification of a facility interruption, Airway Facilities personnel shall determine the cause of the interruption and perform the necessary corrective maintenance to restore the facility to normal operation. The urgency of facility restoration shall be determined by the needs of the users and the impact the service in accordance with Order 6030.31, Restoration of Operational
If the corrective action involves characteristics that can only be verified by flight inspection, the facility shall not be returned to service until flight inspection has been accomplished.

402. DECERTIFICATION OUTAGES.

a. The condition of a facility or essential system, subsystem, or equipment be so serious as to provide erroneous information to the user. Outages due to out-of-tolerance conditions are not considered to be scheduled outages.

b. When a navigational facility's advertised service deteriorates below certification standards, neither AT nor the flying public can discern whether the service is safely usable. Therefore, AF shall decide whether the system or equipment shall be removed from operation in the NAS. The outage shall be coordinated with AT, the certification removed, and the appropriate AF Control Center notified.

c. When communications or surveillance service is deteriorated below certification shall be removed and AT advised of the condition of the system, subsystem, or equipment. An outage shall be requested and an estimate of the time required to certify the service shall be provided. AT personnel will decide whether or not to continue using the uncertified service. An entry shall be made in the appropriate maintenance log describing the situation, including names of personnel contacted.

d. Special coordination procedures with the military have been established by the Joint Radar Planning Group (JRPG) and shall apply as appropriate.

403. OUTAGES DUE TO FLIGHT INSPECTIONS.

During navigation facility flight inspections, if adjustments necessitating an outage are required, System Specialists shall advise the appropriate control center and request a NOTAM be issued.

404. INTERRUPTION REPORTING.

Upon termination of an unscheduled facility interruption, proper notification shall be made to the appropriate AF Control Center. The interruption shall be reported in accordance with Order 6040.15, National Airspace Performance Reporting System (NAPRS).

405. PRIORITIES OF RESTORATION.

The SMO manager or designee shall establish priorities for restoration of out-of-service facilities for delayed responses. However, AT has the responsibility for determining priority of restoration where two or more facilities, systems, subsystems, or equipment are inoperative at the same time. In such cases, and when maintenance resources for restoration cannot be applied to all equipment, a
of restoration shall be requested from the appropriate AT facility in accordance

with Order 6030.31. Military requirements shall be taken into consideration in involving joint-use radar.

406. MOMENTARY INTERRUPTIONS.

Any interruption of the service provided by a system, subsystem, or equipment can a potential cause of mistrust for the users.

a. Switching of operating equipment shall never be done indiscriminately.

b. Before changing equipment or performing any other action on a facility, which may cause momentary interruption of the service, notice shall be given to the appropriate AT personnel.

c. Such switching or changeovers shall not be accomplished until AT personnel concur with such action unless loss of service is imminent.

d. At facilities with only commercial long distance phones for communications, the System Specialist shall coordinate with the control facility for approval of equipment transfer.

407-419. RESERVED.

SECTION 2. PROCEDURES FOR SCHEDULED FACILITY INTERRUPTIONS

420. INTRODUCTION.

This section provides guidance and requirements for scheduling, coordinating and reporting of facility interruptions and their restoration activities. The appropriate AT facility (en route or terminal) is responsible for providing final approval of interruptions for all equipment.

421. RISK MANAGEMENT.

Risk management techniques shall be used to determine the impact to the NAS when scheduling AF maintenance activities.

422. SCHEDULING.

a. General Practices. Maintenance and training should be accomplished, to the extent practical, on the off-line equipment. If maintenance or training on the on-line operating equipment is necessary, it shall be coordinated with the appropriate personnel (AT, military, etc.) and accomplished with minimum interference to facility operation.

b. Schedules for Recurring Maintenance Activities. The SMO shall develop a periodic outage schedule for publication. Schedules shall be approved in advance by the appropriate AT facility manager. Schedules shall be distributed to the AT and AF facility managers. Deviations from an approved outage schedule shall be coordinated with the appropriate AF control center.

c. Schedules for Outages Managed by the Regional Shutdown Committee. Interruptions of long duration (typically 24 hours or greater), shall be coordinated

through a regional shutdown committee.

d. Scheduling of All Other Interruptions. Scheduling for as-needed interruptions shall be coordinated through the appropriate AF Control Center. This includes interruptions for training, changing channels, reconfiguration, scatters, and/or resets.

423. ADVANCE NOTIFICATION.

Whenever possible, the appropriate AT personnel shall be notified not later than day preceding a scheduled outage to allow sufficient time for publication of a NOTAM, rerouting of air traffic, and other activities. Scheduled outages are to be advertised by NOTAM at least 5 hours in advance of the outage.

424. EMERGENCY INTERRUPTIONS.

An emergency interruption is one necessary to prevent failure or damage to the facility. The AT facility shall be given as much advance notice as possible so that appropriate action can be taken. In case of impending catastrophic failure, the responsible System Specialist shall advise the appropriate AF Control Center, shut down the facility, and take appropriate follow-up action.

425. INTERRUPTION COORDINATION.

a. Requests for authority to remove equipment from service shall be directed the appropriate AF Control Center and include the desired time of shutdown, probable duration, and reason.

b. The AF Control Center will coordinate the request with AT personnel and all other appropriate entities, obtain approval or justification for refusal, and advise the requesting organization or the System Specialist of the results.

c. Special coordination procedures with the military have been established by the Joint Radar Planning Group and shall apply.

426. INTERRUPTION APPROVAL REFUSED.

It is incumbent upon AT and AF field personnel to maintain a spirit of cooperation regarding a scheduled interruption. Further, an aggressive periodic maintenance schedule will do much to solidify this cooperation. However, in the event maintenance activities are seriously hampered by repeated refusal to approve interruptions, this shall be reported via official channels. The report shall contain all pertinent information with accurate documentation. Every effort shall made at the local level to work out differences prior to submitting any problem of this nature to the next level for resolution.

427. RESTORATION AND REPORTING ACTIVITIES.

Upon completion of a scheduled interruption, proper notification shall be made to the appropriate AF Control Center. The interruption shall be reported in accordance with Order 6040.15, National Airspace Performance Reporting System (NAPRS).

428-429. RESERVED.

SECTION 3. PROCEDURES FOR SERVICE INTERRUPTIONS

430. INTRODUCTION.

This section provides guidance and requirements for scheduling, coordination and reporting of NAS service interruptions. Service interruptions can be either scheduled or unscheduled.

431. RISK MANAGEMENT.

Risk assessment analysis techniques shall be used to determine the impact to the when scheduling service interruptions.

432. INTERRUPTION COORDINATION.

a. Coordination is required for scheduled service interruptions of any length, whether caused by facility interruptions, or by other causes such as loss of telecommunications.

b. Requests for authority to interrupt service shall be directed to the appropriate AF Control Center and include the desired time of interruption, probable duration, and reason.

c. The AF Control Center will coordinate the request with AT personnel and all other appropriate entities, obtain approval or justification for refusal, and advise the requesting organization or the System Specialist of the results.

d. Special coordination procedures with the military have been established by the JRPG and shall apply.

433. ADVANCE NOTIFICATION.

The appropriate AT facility shall be notified on the day preceding a scheduled service interruption whenever possible to allow sufficient time for activities such as planning, rerouting, and publishing.

434. RESTORATION AND REPORTING ACTIVITIES.

Upon restoration of a service, proper notification shall be made to the appropriate AF Control Center. The interruption shall be reported in accordance with Order 6040.15, National Airspace Performance Reporting System (NAPRS).

435.-439. RESERVED.

SECTION 4. OTHER MAINTENANCE PROCEDURES

440. INTRODUCTION.

This section provides additional maintenance procedures required by System Specialists.

441. ROUTINE MAINTENANCE.

During normal duties, AF personnel shall accomplish the following tasks:

a. Check the operational status of all equipment.

b. Inspect for overheating, leakage, loose hardware, poor electrical connections, worn mechanical parts, and accumulations of dirt, corrosion, rust, mildew, and fungus growth.

c. Report evidence of damage, sabotage, theft, or destruction as required, to the appropriate supervisor.

d. Ensure that facilities and equipment present a clean, well-ordered professional appearance at all times. The cleaning and replacement of all air filters shall be in accordance with local conditions giving special attention to the facility Asbestos Control Program. All equipment storage and workrooms shall be kept clean, and supplies and working equipment stored in a neat and orderly manner.

e. Lubricate all rotating and mechanical devices in accordance with manufacturer's schedules and instructions.

442. FLIGHT INSPECTION PROCEDURES.

This information is general in nature and applicable to most facility types. Detailed maintenance information related to flight inspection of specific types of systems, subsystems, or equipment is found in the flight inspection chapter of the appropriate maintenance handbook(s). In addition, because the flight inspection of system, subsystem, or equipment is a coordinated effort with Aviation System Standards (AVN) personnel, AF personnel shall familiarize themselves with detailed information as published in handbook OA P 8200.1 United States Standard Flight Inspection Manual.

a. Maintenance Performed before Flight Inspection. If time permits, the subsystem, or equipment may be ground checked to be sure there have been no undesirable changes. When two sets of equipment are available and prior approval of an outage can be obtained, the equipment may be checked to determine the possible need for non-routine maintenance. However, maintenance resulting in a delay or postponement of the flight inspection shall not be performed unless it is absolutely necessary. On such occasions, AF personnel should discuss the issue with flight inspection scheduling personnel, who may find it possible to accommodate the delay and use the time in flight inspecting other facilities.

b. Flight Inspection Activities. System Specialists at the facility during flight inspection shall be prepared to correct any observed discrepancy immediately, when possible, as discussed in handbook OA P 8200.1.

(1) Discrepancies corrected during flight inspection will be included in the flight inspection report. When it is impossible to correct a discrepancy while the flight inspection is in progress, AF personnel shall inform flight inspection personnel and take action to correct the discrepancy as soon as possible. Immediately following correction, another flight inspection shall be requested if appropriate. A report of the discrepancies noted during the flight inspection shall be submitted to the immediate AF supervisor.

(2) Occasionally it is necessary to make equipment adjustments that may appear to be abnormal on the basis of previous operational adjustments, or that may exceed tolerances. The need for such adjustments may be due to maladjustment elsewhere in the ground equipment, a change in terrain or multi-path environments,

defective airborne equipment, radio frequency interference, or other factors.

(a) Airway Facilities personnel shall observe equipment performance during the flight inspection and be aware when tolerances are being exceeded or abnormal adjustments are required to satisfy flight inspection.

(b) If measurements made with approved test equipment do not agree with the measurements reported by flight inspection personnel, the flight inspection personnel should be advised and requested to repeat their measurements. If reasonable agreement cannot be attained, the flight inspection measurements shall govern, and a report of the discrepancy shall be submitted to the immediate AF supervisor.

(3) When it is necessary to exceed equipment tolerances to meet flight inspection requirements, the maintenance supervisor shall be notified immediately. The supervisor shall determine whether the variance is sufficiently severe to require immediate investigation or whether the investigation can be deferred. If this determination cannot be made prior to departure of the flight inspection aircraft, the system, subsystem, or equipment may remain in service, provided the following:

(a) The performance stability has not been impaired to the extent that operation will be unreliable.

(b) Flight inspection personnel concur in the continued operation.

(c) The maximum rating or manufacturers specification; e.g., power output, temperature, etc. of equipment is not exceeded.

c. Post-Flight Inspection Actions. During or upon completion of the flight inspection, AF personnel shall accomplish the following actions:

(1) Record meter readings or other data affected by adjustment, correction, or equipment change, if accomplished during the flight inspection.

(2) Make available to flight inspection personnel all pertinent system, subsystem, and equipment parameters needed to complete the flight inspection report, such as transmitter power, or receiver sensitivity.

(3) Discuss with flight inspection personnel any problems encountered during the flight inspection.

d. Readjustment of System Monitor(s) Following Flight Inspection. Handbook OA 8200.1 provides that during periodic and certain special flight inspections, flight inspectors will not request adjustment to a facility that is operating within prescribed tolerances. However, operation within prescribed flight inspection tolerances does not imply that the facility parameters are at the center of their allowable range. Therefore, it is very important that AF personnel avoid re-centering the system monitor(s) or establishing revised references based on normal parameters found acceptable by flight inspection but not necessarily at their optimum values. This will prevent unwarranted "following" of facility parameters.

443. AIRCRAFT REPORTED NAVIGATIONAL AID MALFUNCTIONS.

When a report of a navigational aid facility malfunction is received from an aircraft, AT personnel will request a check from a second aircraft. If AT personnel

cannot obtain a report from a second aircraft within a reasonable time period, AF personnel shall initiate action to investigate the pilot report. If the second aircraft reports normal operation, the incident is recorded by AT personnel with no maintenance action required. If the second aircraft confirms the malfunction, the following steps should be taken:

a. Standby Equipment Available.

(1) Air Traffic personnel will select standby equipment.

(2) If operation is reported normal on standby equipment, operation is continued and AT personnel will notify AF personnel.

(3) Should the malfunction continue or if the standby equipment cannot be selected, treat the reports as if the standby equipment is not available.

b. No Standby Equipment Available. AT or AF shall immediately request a NOTAM removing the potentially suspect navigational aid from operation until one of the following is completed:

(1) A flight inspection can validate proper operation.

(2) The three following maintenance actions are accomplished.

(a) Inspect the ground equipment, perform a standard ground check (if applicable), and correct the fault if one exists.

(b) Certify the appropriate system, subsystem or service. If necessary, request a restoration flight inspection in accordance with the maintenance handbook.

(c) Notify AT personnel of all pertinent facts concerning restoration and make the appropriate entries in the maintenance log.

c. Priority. Maintenance activities shall be prioritized in accordance with assigned restoration strategy for the particular system, subsystem, or service involved.

444. RADIO FREQUENCY INTERFERENCE.

AF personnel shall notify regional Frequency Management Officers if the radio frequency interference (RFI) is suspected.

445. MOISTURE-PROOFING RADIO FREQUENCY CABLE CONNECTIONS.

Facility outages have been attributed to moisture accumulation in outside, unsheltered coaxial cable connectors. The following information is provided as guidance in moisture-proofing these connectors. The material and technique used should be based on the need for permanency and the particular situation.

a. Preliminary. The connectors shall be free of internal moisture and the adhering surfaces shall be dry and free of dirt, grease, oil, or any other substance that could affect adhesion. Prior to mating connectors they should be cleaned with alcohol to ensure that all moisture has evaporated.

b. Semi-Permanent Connections. These materials and techniques offer a reasonable compromise between cost effectiveness and the need for later

accessibility to the treated connection.

(1) Tape only. The use of electrical tape only is satisfactory except where moisture and humidity is high. Two layers of tape should be applied. The wrapping should extend 2 to 3 inches on both sides of the connector, and the wrapping should start at the bottom for both layers if the connection is in a vertical run. Use the proper tape for the local prevailing climate.

(2) Tape and Non-silicone Compound. Having taped the connection as in step (1), additional moisture proofing will result with an application of an appropriate spray-on or a brushed-on sealer. Silicone rubber compounds are not recommended for semipermanent-type connections because the silicone is difficult to remove. Failure to remove the entire silicone compound results in poor adhesion of tape when it is necessary to reseal the connection.

c. Permanent Connections. The following techniques and materials may be employed where access to the connector will probably not be required or where the connection is subjected to excessive moisture.

(1) Sealant. One of the most effective ways of preventing the entry of moisture is to encapsulate the connection with one of several products, which seal against water, yet are easily stripped if repair is ever required.

(2) Heat-shrinkable Tubing. Either thin-wall or thick-wall shrinkable tubing may be applied. The thin-wall type has a shrink ratio of about 2 to 1, while thick wall types have a shrink ratio of about 3 to 1. The thick-wall types are available with a factory-applied sealant that will soften and flow around irregularly shaped surfaces. Heat can be applied with a heat gun.

(3) Tape and Glyptal. Connections may be moisture proofed by application of one layer of rubber electrical tape followed by two layers of friction tape. This wrapping should then be covered with black Glyptal electrical varnish, applied with a brush. Reference 29 CFR 1910.1200.

446. SHIPMENT OF EQUIPMENT.

Airway Facilities personnel shall pack, mark, and ship equipment according to the following guidelines:

a. Preparation and Packing. Modification kits on hand shall be installed equipment is packaged and transferred to another location or depot. Equipment shall be packed such that it will not be damaged in transit. The equipment should be checked for heavy components, such as transformers or motors, that may need additional bracing or support to avoid damage in the event the container is dropped during handling. In some cases, it may be necessary to remove such items and pack them separately. Transformers, capacitors and other equipment may contain Polychlorinated Biphenyl's (PCBs) and require special shipping and handling procedures contained in Order 1050.14, Polychlorinated Biphenyl's in the National Airspace System.

b. Items to be Included. The following items shall be included as appropriate with equipment being shipped:

(1) Documentation (Instruction books, modification and other records.)

(2) Spare parts, cables, and accessory items furnished with the equipment.

(3) Any parts or assemblies removed for reasons other than an agency-wide modification; e.g., any item removed to satisfy conditions unique to one facility but that may be needed if the equipment should be installed at another facility.

c. Packing List. Each individual shipping container, or one container of each shipment, shall contain a packing list showing in detail a complete description and quantities of each item in the shipment. When the packing list is enclosed in one container of the group, that container shall be clearly marked "PACKING LIST INSIDE." It is also permissible to place the packing list in a heavy envelope marked "PACKING LIST," and securely fasten it to one of the containers.

d. Marking. Each shipping container shall be marked to allow identification of contents without unpacking.

447-499. RESERVED.

CHAPTER 5. CERTIFICATION

500. INTRODUCTION.

This chapter establishes FAA requirements for certification of systems, subsystems, and NAS infrastructure services provided to users of the NAS.

501. PHILOSOPHY.

Airway Facilities certification is the determination and validation that a system, subsystem, or service is providing or is capable of providing the advertised to the user. Certification includes an independent determination, which ascertains the quality of advertised services, and a validation, which officially confirms and documents the determination in the maintenance log.

a. Certification is used to determine when a system, subsystem, or service should be continued in, restored to, or removed from service.

b. Certification is performed on periodic and specific occasions, as defined paragraph 503.

c. The process of performing a certification includes the insertion of the prescribed certification statement in the maintenance log.

502. CERTIFICATION RESPONSIBILITIES.

a. The key to the certification program is the part played by the System Specialist whose qualifications have been demonstrated by:

(1) Satisfactorily completing the AF Maintenance Personnel Certification Program.

(2) Maintaining sufficient theoretical and practical knowledge.

(3) Using their professional capacity for independent judgment.

(4) The performance of responsible actions.

b. Personnel with specific written certification authority and responsibility on the subject facility shall perform certification. Certification authority credentials are established in Order 3400.3, Airway Facilities Maintenance Certification Program. Personnel without certification authority may perform maintenance and logging duties. These activities shall either be confined to non-certification parameters or followed with the appropriate certification by a fully qualified System Specialist.

503. CERTIFICATION ACCOMPLISHMENT.

a. System, subsystem, and service certification shall be accomplished by an entry in the appropriate maintenance log, prior to commissioning and periodically thereafter in accordance with applicable maintenance handbooks. Log entries for services without a maintenance log shall be placed in the associated system maintenance log. Certification shall be performed during the restoration process after the following:

(1) An interruption or outage caused by or affecting a certification parameter. Re-certification is not required when a facility with internal monitoring and auto-reset or operator-initiated reset returns to service, and no other action other than the reset was taken.

(2) The removal of certification due to system degradation.

(3) The maximum certification interval has been exceeded.

(4) Any maintenance activity affecting a certification parameter.

b. Certification shall also be performed following an aircraft accident or incident when required by Order 8020.11, Aircraft Accident and Incident Notification, Investigation and Reporting.

504. CERTIFICATION CRITERIA.

All required certifications shall be listed in Appendix 3, Systems, Subsystems, and Services Requiring Certification. The following rules shall be used by the appropriate headquarters organization to determine which systems, subsystems, and services require certification.

a. FAA NAS systems, subsystems, and services directly affecting the flying public shall be certified when they do any of the following:

(1) Provide moment-by-moment positional information to pilots or Air Traffic personnel during aircraft operations.

(2) Provide necessary communication or communication control among pilots and Air Traffic personnel during the above aircraft operations.

(3) Provide decision support information that could affect aircraft heading, altitude, routing, control, or conflict awareness.

(4) Provide essential meteorological information for takeoff and landing aircraft at airports.

(5) Provide short term, long term, continuous, and conditioned power to a system or subsystem requiring certification.

b. Certification is not required for weather systems of an advisory nature, supportive facilities, and intermediate facilities. This includes systems used exclusively by AF for maintenance support activities at AF Control Centers.

(1) Examples of weather advisory facilities are weather fixed map units (WFMU), and radar remote weather display systems (RRWDS).

(2) Examples of supportive facilities are electrical distribution systems (ELD) and an Uninterruptible Power Supply (UPS) without all of the following:

(a) Power conditioner.

(b) Long term power source; e.g. engine generator, or solar cells.

(c) Short term power source; e.g. batteries, or flywheel.

(3) Examples of intermediate facilities are:

(a) Radio communications links (RCL).

(b) Television microwave links (TML).

(c) Data multiplex (DMUX).

(d) Bandwidth manager (BWM).

505. SERVICE CERTIFICATION.

a. A service is an intangible functional benefit provided by individual and/or subsystems working together. Theseservices shall be certified as a NAS infrastructure service.

b. Service certification is based upon several fundamental characteristics of NAS service such as:

(1) Constituent systems and subsystems are certified.

(2) Indications on monitor and control consoles are normal.

(3) Customer activity reports contain no complaints.

c. Appendix 3 shows the hierarchical relationship between facilities; i.e., systems and subsystems and the associated NAS service they provide.

506. BASIS OF CERTIFICATION.

a. The basis of certification is the determination that the system or is providing (or capable of providing; e.g., standby equipment), the advertised service to the user.

b. Some NAS systems contain user (AT) controls that will allow a certification parameter to be adjusted beyond its tolerance or limit. An action of this nature shall not void the certification.

507. GENERAL CERTIFICATION TECHNIQUES.

a. The FAA has identified systems requiring certification and the parameters on those systems, but the choice of methods used for certification determination is left to the professional judgment of the certifying System Specialist. The System Specialist may use one, several, or a combination of various methods to determine that a system is providing the advertised user service. Generally, performance of the prescribed system periodic maintenance tasks will provide the necessary information for this determination.

b. Specific maintenance procedures for a particular system may be found in maintenance handbooks, instruction books, or other technical documentation. Other maintenance methods available to support a certification determination include:

(1) Direct measurement of certification parameters. Values approved by NCP shall be used in place of directive values.

(2) Monitor indications. These should include the satisfactory operation of both the control and remote indications.

(3) By recording and analysis of required information on technical performance record forms (FAA Form 6000 series).

(4) By performing a comparative analysis of flight inspection data with previous results.

(5) Visual and aural observations, such as meter readings, radar display, pilot instrument indications, and absence of extraneous noises, excessive heat, or questionable odors.

(6) User (pilot) report of satisfactory operation as with a voice communication check on RCAG equipment.

(7) By the completion of local or remotely conducted hardware or software diagnostic tests, where that capability exists.

508. REMOTE CERTIFICATION.

Systems and services may be certified via remote maintenance monitoring (RMM) when the capability to remotely verify system certification parameters is available.

a. If a Remote Monitoring System (RMS) is used as a substitute for calibrated test equipment to provide data for certification, the following requirements shall be met:

(1) The RMS shall be calibrated or verified at least annually to achieve accuracy appropriate to the measured parameter's tolerance.

(2) Verification of RMS accuracy may be accomplished through comparison to the equivalent calibrated test equipment. When this method is used as a transfer standard, RMS accuracy requirements shall be defined in the applicable equipment handbook.

(3) The RMS data accuracy shall be verified through the operating range specified under standards and tolerances in the applicable equipment handbook.

b. When RMS equipment is impaired, the certifying System Specialist must be confident that the impairment does not affect the certification process. If it does,

the RMS capability cannot be used for remote certifications.

509. REMOVAL OF CERTIFICATION.

a. The following measures shall be taken when a certifying System Specialist determines that a service, system, or subsystem is no longer providing the advertised service(s):

(1) Appropriate AF and AT personnel shall be notified.

(2) Restoration activities shall be initiated.

(3) Certification is considered to be removed and shall be performed prior to restoration.

b. Removal of certification does not necessarily require an interruption of related equipment. (See paragraph 402 for detailed guidance on decertification outages.)

c. AT may choose to continue using a communication or surveillance system even though it is no longer certified. If so, the System Specialist shall remove the certification by making a maintenance log entry; e.g. ASR decertified.

510. PARTIAL CERTIFICATION.

A system or subsystem may be unable to satisfy all certification parameters but still provide a reliable reduced service. In that event, a partial certification be used with a certification log entry; e.g. ASR certified except (portion unavailable). A corresponding certification log entry shall be made when the full service is restored. The issuance of partial certification does not necessarily require an interruption of the system, subsystem, or equipment. Facilities that are designed to automatically downgrade to another level of service; e.g., second generation Tactical Air Navigation (TACAN), ARTS-IIIA, Mode-S, and some visual navigational aids, are excluded from this requirement.

511. FREQUENCY OF CERTIFICATION.

Normal and maximum periodic certification intervals are established, based upon the criticality of user service and performance stability of the system in question. A window of opportunity is established around the due date to ensure accomplishment the regular interval. These intervals are noted in the applicable maintenance handbooks.

a. The NORMAL certification interval is to be used on a routine basis for scheduling. Generally this interval is equal to the PM interval.

b. The MAXIMUM certification interval is that beyond which reliable system performance can no longer be assured without verification. Generally this interval is equal to the normal interval plus the length of one accomplishment window.

512. EXPIRATION OF MAXIMUM CERTIFICATION INTERVAL.

a. Maximum effort shall be made to certify a system before the expiration of the maximum certification interval. This effort may include early certification to move the next interval to a more favorable timeframe, use of alternate methods of certification determination listed in paragraph 507b, or use of personnel from

outside the work center, etc.

b. If a facility certification maximum interval is exceeded, the certification is no longer valid and the following actions shall be taken:

(1) Notify the appropriate AF Control Center. AT may elect to continue using the facility.

(2) Ensure a NOTAM is issued for systems providing a direct service to the flying public, stating: "(subject of the NOTAM) may be unreliable."

(3) Make an entry in the maintenance log noting the maximum certification interval has been exceeded.

(4) Notify the AF division at the regional office.

513. CERTIFICATION REQUIREMENT ANALYSIS.

New systems, services, and equipment are continually added to the facility population in the NAS. Each of these will be included in Appendix 3, Systems, Subsystems, and Services Requiring Certification, if it meets the requirement criteria of paragraph 504. Advertised services, corresponding certification parameters, and other requirements will then be issued in the appropriate maintenance handbook.

a. Systems, subsystems, or services shall be certified prior to operational if their functionality meets the certification criteria of paragraph 504. Certification requirements:

(1) Shall be issued by the Program Director for NAS Operations, AOP-1 prior to operational use, and fully coordinated with the appropriate AF operations support organizations in the headquarters and regional offices of concern.

(2) Shall be based on the intended operational functionality.

b. New or prototype systems occasionally require a lengthy test and evaluation involving control of live air traffic before commissioning.

(1) A new or prototype system used in this manner shall be certified based on interim certification requirements if these requirements have not yet been published in the applicable maintenance handbook.

(2) It is the responsibility of the sponsoring requirements organization to coordinate the establishment of any certification requirements with AOP-1 for new or prototype systems at least 90 days prior to planned operational use.

(3) If a prototype system must be altered in a way that materially affects certification parameters, certification requirements shall be re-coordinated with AOP-1. Otherwise it shall not be certified.

514.-599. RESERVED.

CHAPTER 6. PROTECTION OF AGENCY PROPERTY AND PERSONNEL

SECTION 1. SAFETY HAZARDS

600. INTRODUCTION.

This section provides guidance on FAA directives in the 3900 series and FAA safety alert directives discussing personnel safety at FAA facilities. Many of these directives contain precautions regarding personnel safety and identification of hazards in the workplace.

601. LOCKOUT/TAGOUT PROCEDURES.

Prior to servicing or maintaining equipment, where unexpected energizing, start-up, or release of stored energy could occur, the equipment shall be isolated and rendered inoperable through the use of a lockout device. If this is not possible, then a tag-out device shall be used. The supervisor shall designate authorized persons whose work involves energized circuits, and once designated shall receive training as identified in 29 CFR 1910.147 and Subpart S (1910.331). If employees permitted to work on or near exposed energized parts, they shall receive training recognition, determination, safe approach distances, and safety practices specific to the hazard. Such employees (29 CFR 1910 Subpart S) shall use appropriate tools and personal protective equipment.

602. ELECTRICAL SHOCK HAZARDS.

Personnel shall exercise extreme care while working on equipment, particularly dangerous high voltages or high currents exist. Contact with A.C., D.C., or RF potentials can result in severe shocks, burns, or loss of life.

a. Particular attention shall be given to the proper methods of measuring electrical energy potential prior to working around stored energy devices or high-voltage circuits.

b. Lockout/tagout procedures shall be used.

c. A grounding stick shall be used to discharge dangerous stored energy.

d. The wearing of jewelry, e.g. watches, rings, or bracelets, is not recommended. Reference Order 3900.19, Occupational Safety and Health Program.

603. RADIATION HAZARDS.

High power transmitters used in surveillance and communications systems, and equipment may present radiation hazards to AF personnel, if precautions are not followed.

a. Work on equipment capable of producing radiation shall be scheduled when equipment can be de-energized. If this is not possible, monitoring should be conducted to ensure exposure does not exceed recommended levels as found in 29 CFR 1910.97.

b. Order 6050.32, Spectrum Management Regulations and Procedures Manual, provides procedures and criteria for the evaluation and control of radiation in the occupational environment, identifies specific hazards, and describes precautions which shall be observed by FAA personnel.

604. EQUIPMENT INTERLOCKS.

DO NOT DEPEND ON INTERLOCK SWITCHES TO REMOVE HAZARDOUS VOLTAGES. Interlocks are a substitute for proper lockout/tagout procedures. Always touch circuits with the grounding stick before touching them with the hands or body. Access gate, door, or safety interlock switches shall not be removed, short circuited, or tampered with any way, except by authorized System Specialist.

605. INTEGRATED CIRCUIT PRECAUTIONS.

External grounds and A.C. lines shall be disconnected to eliminate ground-return paths before touching semiconductor device terminals with hand tools or soldering tools. Do not test any semiconductor device without carefully observing limitations and polarity.

606. HEAT SINKS.

Where heat sinks are used, it is important to recognize and avoid certain maintenance activities that could result in damage to the equipment or present a shock hazard to the maintenance person. Do not block or restrict the convection airflow over the heat sink, and recognize that the heat sink may not be at chassis ground potential.

607. HEAT DAMAGE TO PRINTED CIRCUIT BOARDS.

Caution should be exercised to prevent heat damage to printed circuit boards caused by the overheating of board mounted components.

608. SILVER SOLDER.

Cadmium Oxide fumes are a by-product of using hard solders; e.g., when brazing air-conditioner refrigerant lines.

a. When cadmium containing silver brazing alloy is heated appreciably above melting point, acutely poisonous brown or yellow cadmium oxide fumes are released.

b. Inhalation of cadmium oxide fumes, even short exposures to high concentrations, can result in serious and sometimes fatal injury.

c. Precaution should be taken to ensure adequate ventilation is available whenever any silver solder is used. Where adequate ventilation cannot be supplied, respirators shall be used to effectively prevent serious exposure to the cadmium oxide fumes.

609. MACHINERY AND TOOLS.

a. Gloves, ties, and loose clothing shall not be worn around moving machinery.

b. Tools should be kept clean and in good working condition.

c. Bench grinders, drill presses, vises, and other similar tools should be bolted to the workbench.

d. Always wear goggles when hazards to the eyes are present.

e. Avoid cleaning, adjusting, or lubricating machinery while it is in operation.

f. Before any repairs are undertaken, open all electrical switches controlling the equipment, and tag or lock them to prevent accidental closing.

610. MATERIAL SAFETY DATA SHEET.

Prior to handling any solvent, personnel shall review the material safety data (MSDS). The MSDS contains the following information:

a. The material's physical properties.

b. Fast-acting health effects and the amount of personal protective equipment (PPE) needed.

c. First aid treatment to be provided when exposed to a hazard.

d. The preplanning needed for safely handling spills, fires, and day-to-day usage.

e. How to respond to accidents.

611. CLEANING SOLVENTS.

Any chlorinated or petroleum base solvent, such as trichloroethane or stanisol, meets health and safety requirements may be used for cleaning. Whenever any or cleaners are used, the following guidelines apply:

a. Adequate ventilation shall be provided.

b. Care should be used in cleaning equipment with solvents, especially where the temperature of the air or parts being cleaned is in excess of 100° F (38° C).

c. Solvents shall be stored in safety cans.

d. Isopropyl alcohol is a recommended cleaning substitute where circuit elements involve rubber terminal seals. Trichlorethylene has been identified as the cause of multiple printed-circuit board capacitor failures, because it affected rubber seals on the capacitors. Reference 29 CFR 1910.1200 Hazard Communication (Workers Right to Know).

e. Contact environmental and safety staff for disposal and respiratory requirements.

612. USE OF FIRE EXTINGUISHER.

A multipurpose dry chemical (class A, B, C) or CO_2 fire extinguisher shall be maintained, inspected, and used in combating electronic fires in accordance with 29 CFR 1910.157, Portable Fire Suppression Equipment, Order 6930.1, Fire Prevention and Maintenance of Fire Protection Equipment, and Order 3900.19.

613. WORKING ON ELEVATED STRUCTURES.

Employees shall use fall restraint devices and exercise extreme caution when

on elevated structures to prevent injuries. Fall protection systems include railings, perimeter lines, nets, spotters, and fall arrest systems. At some locations, ice is a special hazard. Not only is climbing dangerous when ice is present, but there is also the very real hazard of ice falling from elevated structures because of wind or thawing conditions.

614. GROUNDING PORTABLE EQUIPMENT.

All portable test equipment and electric tools shall be grounded before use. The only exceptions are for test equipment measurements that must be isolated from ground, or electric hand tools that are classified as being double insulated and approved for use without a grounding type A.C. plug. Adapters for connecting grounding type A.C. plugs to non-grounding type ac receptacles shall be used with caution.

615. BATTERY SAFETY, ACID SPILLS AND BURNS, AND EXPLOSION HAZARDS.

System Specialists are required to inspect, evaluate, and maintain several types of storage batteries. Knowledge of batteries and needed safety precautions will the System Specialist from hazards or further injury should an accident occur. Specific guidance on batteries is located in Order 6980.25, Maintenance of for Standby Power.

a. Battery Hazards. Some hazards to be considered when handling batteries include:

(1) Improper lifting procedures will cause muscle strains. Improper gripping will allow the battery to slip from a person's grasp. When batteries of this size are placed in a position where muscle strains may occur, a mechanical lifting device should be used or two people should do the lifting.

(2) Many batteries contain a liquid solution, which means that the center of balance can change. If a person's grasp on the battery is not secure, the battery can slip from their hands. A battery should be carried with an insulated battery strap or a battery cradle. The battery strap attaches to the battery terminals to form a handle for carrying. The battery cradle encases the battery with insulated netting material or is a platform with a handle for carrying.

(3) Battery fumes may be harmful to personnel because of:

(a) The hazards of breathing the fumes themselves.

(b) The lack of oxygen displaced by fumes.

(c) Explosion hazard.

(4) Splashes may occur when pouring prepared electrolyte into batteries, mixing electrolyte, checking the electrolyte levels, or charging batteries.

b. Industrial Batteries. Industrial batteries, such as those used in heavy equipment or power conditioning systems, weigh several hundred pounds. A mechanical lifting device should always be used for moving industrial batteries. Handling batteries of this size should not be attempted without proper equipment and operational knowledge. Some mechanical lifting devices are:

(1) Chain hoists.

(2) Overhead cranes.

(3) Forklifts.

c. Lead-Acid Batteries. Batteries such as lead-acid batteries contain an electrolyte, which is a mixture of sulfuric acid and water. This acid solution is corrosive to certain metals, will destroy clothing, and can cause severe burns or blindness. Batteries of this type are designed to be used in a level or near-level position. These batteries are equipped with vent caps that allow hydrogen gas to escape while preventing the electrolyte from splashing out. The caps will allow some tilting of the battery; however, prolonged tilting or inversion of the battery will allow the electrolyte to leak. When carrying a battery-containing electrolyte, use a battery strap or cradle. Dripping electrolyte on clothing will destroy most fabrics, if the solution is not neutralized immediately after the spill. Reference material safety data sheets on batteries for proper protective equipment. Using any of the following solutions can neutralize the electrolyte:

(1) Bicarbonate of Soda. Bicarbonate of soda mixed with water can be used to rinse the area of an acid spill.

(2) Soda Ash. The soda solution will neutralize the corrosive effects of the sulfuric acid.

NOTE: Bicarbonate of soda and soda ash are harmless to the skin. These solutions should be used to prevent acid burns where acid was spilled on the skin.

(3) Caustic Soda. Caustic soda will neutralize the acid, but it can cause skin burns. Caustic soda should be used with extreme care, ensuring that the solution does not come in contact with the skin or eyes.

d. Acid Burns. Acid burns to the skin should be treated immediately. A physician should inspect the area as soon as possible for damages which may not be apparent. Remove clothing on which the acid solution has been spilled. Remember that chemical burns to the skin will occur if the electrolyte is allowed to remain in contact with the skin.

e. First Aid. There may be occasions when a System Specialist will have to mix electrolyte. Before mixing this acid solution, the Specialist should know where the first aid equipment is located, how to administer first aid to oneself or to fellow workers, and the nearest source of running water or a sealed container of eyewash. Splashing electrolyte acid into the eyes requires immediate first aid. Should this occur, flush the eyes with running water, and see a physician as soon as possible. Do not apply neutralizing agents or salves to the eyes, or do not rub the eyes.

NOTE: Damage to the eyes by acid solutions can cause blindness. Rubbing the eyes or applying salves or neutralizing agents can cause further damage. Flush the eyes with an approved eyewash system. All FAA battery work areas shall be equipped with eyewash systems.

f. Protective Equipment. The best protection against chemical burns when working with electrolyte is protective clothing. Protective equipment, such as splash proof goggles, face shield, gloves, and an apron, shall be worn at all times when the hazard of electrolyte splash or spill is present.

g. Mixing Electrolyte. Pouring prepared electrolyte into batteries, mixing electrolyte, checking the electrolyte levels, or charging batteries are times when

splashes may occur. Mixing electrolyte improperly may cause an accident that requires immediate first aid.

CAUTION: When mixing electrolyte, always pour acid into water. Never pour water into acid.

h. Explosion Hazards (Batteries).

(1) Hydrogen is generated when some batteries are being charged or recharged. The electrochemical process also produces heat. The hydrogen and heat could create a volatile situation. Overheating can be damaging to the internal composition of the battery, while hydrogen could be explosive.

(2) During the charge and recharge periods, hydrogen is released through the vent caps. Hydrogen is 14 times lighter than air and is dispersed quite rapidly outside the battery cells. Air containing as little as 4 percent hydrogen is highly volatile if ignited.

(3) Batteries should be maintained in a well-ventilated and ignition-free area. Some sources of ignition are:

(a) Open flames from any source.

(b) Sparks from welding or electrical equipment.

(c) Lighted cigarettes.

(d) Sparks caused by connecting batteries to electrical circuits or charging systems.

i. Working Equipment.

(1) Use a flashlight that will not cause a spark to inspect electrolyte levels of a battery.

(2) Always use well-insulated tools when working on or around batteries. The combination of heat and hydrogen gas generated by recharging a battery can be explosive.

(3) Always assume that there is explosive potential at the battery vent caps and practice those procedures that ensure the safety of yourself and others.

616. CHLOROFLUOROCARBONS.

Chlorofluorocarbons (CFCs) are used as refrigerants in air conditioners, refrigeration units, chillers, and condensers. Restrictions have been put in place on the production, use, and handling of CFCs and related compounds by the Environmental Protection Agency (EPA). CFCs and the equipment that use them are slated for replacement. CFCs used as refrigerants are subject to strict recovery recycling requirements to prevent the release of refrigerant gases to the atmosphere. CFC equipment servicing can only be performed by EPA certified technicians. Consult the supervisor or environmental staff about handling requirements.

617. EQUIPMENT POWER CONNECTIONS.

Particular attention should be given to power circuits of equipment designed for with multiple input voltages. The wiring diagram, rather than the color coding of the equipment's internal wiring, should be checked when connecting or servicing equipment.

618. POLYCHLORINATED BIPHENYLS (PCB).

PCBs, even at extremely low concentrations, present a health hazard. Order 1050.14, Polychlorinated Biphenyl's in the National Airspace System, provides the FAA policy on procedures and responsibilities for personnel safety and regulation compliance concerning PCBs.

619. ELECTROSTATIC DISCHARGE (ESD).

Semiconductor devices can be damaged by electrostatic discharges (ESD). Proper ESD procedures shall be employed to discharge energy before handling semiconductors. following guidelines describe an ESD prevention method that is consistent with the intent of proper handling and protection of ESD sensitive components.

a. Assume that all circuit packs containing electronic (solid-state) can be damaged by ESD.

b. When handling circuit packs (storing, inserting, and removing), always use the appropriate grounding procedure: either a wrist strap connected to ground or, when standing, a heel strap with a grounded dissipative floor mat. Handle all circuit packs by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, conductors, or connector pins.

c. Observe warning labels on bags and cartons. Whenever possible, do not circuit packs from antistatic bags or cartons until ready to insert into operation. Open all circuit packs at a static-safe work position with wrist straps and dissipative tablemats.

d. Always store and transport circuit packs in antistatic packaging. Shielding is not required.

e. Keep all static-generating materials, such as food wrappers, plastics, and Styrofoam containers, away from all circuit packs.

f. Upon removal from storage, immediately put circuit packs into antistatic packages.

g. Whenever possible, maintain relative humidity above the 20-percent level.

h. Some anti-static bags are conductive. Care should be taken to prevent accidental shorts between the bag and current carrying circuits.

SECTION 2. THEFT AND VANDALISM REPORTING

620. INTRODUCTION.

This section provides guidance for reporting instances of theft or vandalism.

621. THEFT OR VANDALISM REPORTING REQUIREMENTS.

All incidents involving theft of, or malicious damage to, government personal and real property shall be reported to the appropriate AF control center as soon as possible which in turn should notify management personnel and local agency security representatives. In addition, these incidents shall be reported to such other law enforcement agencies as may be required (local police, state police, and the Bureau of Investigation).

622. PROTECTION OF GOVERNMENT PROPERTY.

a. Employees discovering incidents of vandalism shall take immediate action to assess the extent of damages and shall take those steps necessary to prevent further loss of government property. (This action might include such measures as temporary repairs to buildings, fences, or security lights.) In instances involving the theft of FAA property and equipment and immediately upon discovery, the SMO manager or designee should ensure that the regional Civil Aviation Security Division shall be provided with the appropriate serial numbers for each item stolen. Incidents involving theft or damage to a facility shall be noted in the maintenance log in sufficient detail to describe conditions. The appropriate AF control center and AT personnel shall be advised of facility status and NOTAMs shall be issued as necessary.

b. In incidents of recurring vandalism involving FAA facilities, the SMO manager or designee, in cooperation with regional representatives, shall take such action as deemed appropriate to prevent further occurrence of such incidents. This might include, but is not limited to, installing burglar alarms, 24-hour facility surveillance, or fencing.

623. REFERENCE.

For detailed information, refer to Order 1600.6, Physical Security Management Program.

624-629. RESERVED.

SECTION 3. SECURITY

630. INTRODUCTION.

This section provides security information for AF personnel.

631. MILITARY EMERGENCIES

Military necessity may require some navigational aids to be shut down during military emergencies in accordance with Order 7610.4, Special Military Operations.

632. COMPUTER SECURITY, PRIVACY, AND FREEDOM OF INFORMATION ACT.

Certain legal restrictions are placed on the collection, use, and dissemination of information. See Order 1280.1, Protecting Privacy of Information About Individuals, and Order 1370.82, Information Systems Security Program. These requirements shall applied, when and where appropriate, to the provisions of this directive.

a. Automated Data Processing. Order 1370.82 discusses security requirements responsibilities for FAA facilities and personnel. Regardless of automated system type; e.g., MMS, 2nd GEN VORTAC, IMCS, or other RMM systems, the user shall not disclose the individual password to another user or non-user. If the user believes that the individual password has been compromised, then the password shall be changed. The user shall be responsible for maintaining the integrity of the individual password.

b. Accreditation. Accreditation of the automation program and equipment shall be obtained from the regional Security Division. If the computer has or contains sensitive information, then the computer/facility shall be compliant with the computer security requirements of Order 1370.82.

633.-639. RESERVED.

SECTION 4. SAFETY ON AIRPORTS.

640. INTRODUCTION.

This section provides guidance to ensure personnel safety.

641. AIRCRAFT JET BLAST HAZARD.

Use caution when crossing runways behind jet aircraft to avoid accidents resulting in damage to vehicles or injuries to FAA personnel by jet blast.

642. HEARING PROTECTION.

Hearing protection should be worn when noise hazards are present.

643. USE OF VEHICLES ON AIRPORTS.

a. All vehicles used in the performance of maintenance duties and operating upon any part of an airport landing and taxiing area shall display the proper flag or amber beacon required by Order 4670.2, Motor Vehicle Management. At all airports with an airport traffic control tower, vehicles operating on or across usable runways or taxiways shall be equipped for two-way radio communication with the tower ground traffic controller.

b. FAA employees shall obtain clearance from AT before crossing an airport runway or taxiway, and then shall cross without delay.

c. All test and working equipment, tool boxes, or other cargo should be firmly lashed down, shock mounted, or placed securely in the trunk compartment.

d. FAA employees shall use peripheral service roads whenever possible. The crossing and use of active runways should be kept to a minimum.

e. Measurements which must be made on an active runway shall be accomplished during low-activity periods whenever possible, and two-way radio communications shall be maintained with the ground traffic controller at all times. These activities shall be accomplished as rapidly as possible.

f. At non-controlled airports (no local airport traffic control tower), documented ground rules shall be established to ensure adequate safety of vehicles and FAA personnel while operating upon any part of the landing or taxiing areas. These ground rules shall include, but shall not be limited to:

(1) Provisions for aircraft right-of-way over ground vehicles.

(2) Requirements for vehicle operators to bring their vehicles to a complete stop at least 100 feet from runway and 25 feet from a taxiway, look both ways, and listen for aircraft in the vicinity. The vehicle operator should proceed only when they will not impede an aircraft. Always proceed with caution after this visual check.

(3) Utilization of Unicom procedures, such as:

(a) Monitor aircraft transmissions for situational awareness. Listen before transmitting.

(b) Unicom is used at uncontrolled fields, therefore you must always announce your intentions before entering aircraft movement areas.

(c) Unicom is a party-line frequency; always use an appropriate radio call sign and identify your location.

APPENDIX 1. DEFINITIONS

1. AF CONTROL CENTER. The AF Control Center is the NAS management entity for coordination with AT or other users of the NAS.

2. ANNUAL. A scheduling term, meaning once every year, and at 12 month intervals.

3. AS REQUIRED. A scheduling term, meaning whenever the need has been detected.

4. ASSEMBLY. Two or more parts joined together to perform one or more elementary functions not normally subject to disassembly without losing the designed function.

5. BASELINE. A configuration identification document or a set of such documents formally designated and fixed at a specific time during the configuration items life cycle. Baselines, plus approved changes to those baselines, constitute the current configuration identification. FAA establishes baselines of NAS requirements, for each NAS design level, for the four major acquisition baselines, as well as for the NAS product baseline.

6. BI-ANNUAL. A scheduling term, meaning once every 2 years, and at 24 month intervals.

7. BI-WEEKLY. A scheduling term, meaning once every 2 weeks, and at 14 day intervals. Also known as Semi-Monthly.

8. CERTIFICATION. Determination, validation, and documentation that a system, subsystem, or Service is providing or is capable of providing the advertised service to the user. The certification includes independent determination about when a system, subsystem, or Service should be continued in, restored to, or removed from service, and insertion of the prescribed entry in the maintenance log. (See Chapter

5 of this order.)

9. CERTIFICATION PARAMETER. Certification parameters are selected critical indicators of the quality of the required advertised services being provided to the user of Systems, Subsystems, Equipment, and Services.

10. COMMISSIONED. A facility, system, subsystem, or equipment is considered to be commissioned if it has been formally accepted and placed into operational use of service in the NAS. It indicates that Airway Facilities has assumed formal maintenance responsibility.

11. COMMISSIONING. The formal exercise of incorporating a facility, system, subsystem, or equipment into the NAS. This term has legal and budgetary significance and has been used to justify logistic and manpower operational support as a FAA obligation under public law.

12. CONFIGURATION CONTROL DECISION (CCD). A record of decision on a proposed change to a baseline configuration item. If a change is approved, a CCD directs the action required implementing the decision.

13. CONFIGURATION MANAGEMENT. A discipline applying technical and administrative direction and surveillance to:

a. Identify and document the functional and physical characteristics of a configuration item.

b. Control changes to those characteristics.

c. Record and report change processing and implementation status.

14. COORDINATED UNIVERSAL TIME. See UTC.

15. CORRECTIVE MAINTENANCE. Corrective maintenance is maintenance performed to identify or correct a problem.

16. DAILY. As used in stating a maintenance schedule, daily is intended to mean every calendar day for those locations staffed 7 days a week. At other locations, daily is intended to mean every calendar day resident staffing is on duty, the schedule may be reduced to a minimum of 3 times a week, with not more then 3 days between successive repetitions, in the event of any emergency, and at nonresident or one-man locations.

17. DECISION SUPPORT SYSTEMS. Decision support systems provide routing information to improve efficiency and freedom of flight.

18. ELECTRONIC LOG. A chronological record of all maintenance activities (such as restoration, repair, modification, flight checks, certification) contained or resident on a software system running on a computer. It will consist of a combination of databases of logged entries as well as reference tables of data that may be inserted (by default or manually) into the logging entry for validation and linking of information.

19. EMERGENCY MODIFICATION. An emergency modification is a temporary modification installed to maintain continuity of air navigation, air traffic control, communications, or support service during unusual or emergency conditions.

20. EQUIPMENT. Equipment is a complete assembly, operating either independently or within a subsystem or system, that performs a specific function.

21. EQUIPMENT UNIT. A complete assembly, designed to perform a function, consisting of components, modules, parts, and associated hardware, including the cabinet, supporting base, or shock mounts.

22. FACILITY. Used generically in this order; reference Order 6000.5, Facility Service and Equipment Profile, for other uses of this term.

23. FIRMWARE. Software instructions which have been permanently stored in read-only memory (ROM.)

24. GROUND CHECK. A ground check is an evaluation, performed without an aircraft, the radiated signal associated with a system, subsystem, or equipment.

25. HARDWARE. In computer applications and elsewhere, the term hardware refers to the physical equipment of devices used to perform simple or complex functions. This term must be qualified by an appropriate restrictive modifier to carry a specific identification or meaning.

26. INITIAL TOLERANCE/LIMIT. As used in maintenance technical handbooks, the initial tolerance/limit is the maximum allowable deviation from the standard value of a parameter, or the range, that was acceptable or permissible at the time of initial installation, tune up, or construction; that will be allowable after any modification or modernization; and that is desirable after any readjustment following an out-of-tolerance/limit condition.

27. INSURANCE STOCK. These are items of material essential for continued service of a facility, or for human safety, for which procurement delays are intolerable.

28. INTERRUPTION. A break in continuity, the loss or unavailability of a facility/Service, regardless of duration or cause.

29. JOINT-USE. Whenever an installed facility, system, subsystem, or equipment provides services to both the FAA and one or more other agencies or military services, it is known as “joint-use.” Either FAA or the sharing organization may own the facility, system, subsystem, or equipment. The term is used primarily in connection with radars.

30. KEY PERFORMANCE PARAMETER. A key performance parameter is a selected parameter of the system, subsystem, or equipment, which is a critical indicator of whether or not it is performing its intended function. These parameters are clearly identified in maintenance technical directives with an arrow.

31. LOGISTIC SUPPORT. A disciplined, unified, and iterative approach to the management and support of NAS operational requirements through the acquisition, storage, distribution, and inventory control of supplies, spare parts, tools, and working equipment. Logistic Support is necessary to:

a. Integrate support considerations into system and equipment design.

b. Develop support requirements that are related consistently to readiness objectives, to design, and to each other.

c. Acquire the required support.

d. Provide the required support during the in-service phase at minimal cost.

32. MAINTENANCE. Maintenance, as used in connection with AF systems, subsystems, equipment, is intended to mean any specified sequence of steps prescribed to accomplish an activity to verify or continue a system or service as operational. As used in maintenance technical directives issued before 1970, the term was more restrictive in that it only applied to corrective maintenance activities; i.e., repair, adjustment, calibration, troubleshooting, or other functions.

33. MAY. As used in maintenance documentation, MAY denotes permission. For example: at navigational aid facilities, certain maintenance activities MAY be performed without recourse to flight inspection. See Order 1320.1, FAA Directives System. (Also see Shall, Should, and Will.)

34. MODIFICATION. A modification to a ground facility, system, subsystem or equipment is an alteration in its electrical, mechanical, or physical characteristics, arrangement, configuration, or use that results in a need for:

a. Changes to record documentation.

b. Changes to existing standards and tolerances/limits.

c. The need for establishing new standards and tolerances/limits.

NOTE: See Order 6032.1, Modifications to Ground Facilities, Systems, and Equipment in the National Airspace System.

35. MONITOR. A monitor is a device designed to detect when a designated parameter has deviated beyond its prescribed tolerance/limit, and then to activate an alarm to this effect or alter the operation or both.

36. MONTHLY. A scheduling term, meaning once every 30 days or at approximately 30-day intervals. A calendar month is the period between like dates in successive months.

37. NAS CHANGE PROPOSAL (NCP). The means for proposing changes to NAS configuration items, FAA Form 1800-2.

38. NAS-MD-001. This is the document that lists all of the NAS items (including hardware, software, and documentation) that are under configuration management.

39. NONSTANDARD SPARE PARTS. These are replaceable parts (often-called parts peculiar) that are unique in characteristic or function to the degree that they are not readily obtainable from sources other than the prime contractor.

40. OFFICE OF PRIMARY INTEREST (OPI). The organizational element primarily by decisions or actions of the OPR and held accountable for proper responsiveness, coordination, and feedback prior to assumption of OPR status in the next sequence of events, is considered the office of primary interest.

41. OFFICE OF PRIMARY RESPONSIBILITY (OPR). The organizational element held accountable for taking appropriate action or for making a decision between alternatives at a specific turn of events is considered the office of primary responsibility.

42. OFF-THE-SHELF ITEMS. These are commercial items of equipment and test equipment

that are sold in substantial quantities to the general public at established or market prices.

43. OPERATING STOCK. This is the quantity of material stored onsite to meet anticipated operating requirements during the interval between replenishment actions, based on the annual demand value of each item.

44. OPERATING TOLERANCE/LIMIT. As used in maintenance handbooks, the operating tolerance/limit is the maximum deviation from the standard value of a parameter, or the range within which normal functioning can continue without adjustment or corrective maintenance, and beyond which remedial action System Specialists is mandatory.

45. OTHER MAINTENANCE TASK. As used in maintenance handbooks issued in 1970 and later, an "other maintenance task" is any periodic scheduled task other than a performance check that is necessary to prevent deterioration or ensure reliable operation of the system. These tasks are not performance checks. PM activities now prescribed in maintenance handbooks are separated into performance checks and other maintenance tasks. The term is not used in maintenance handbooks issued before 1970.

46. OUTAGE. The loss of a facility/service for 1 minute or more.

47. PART. This is a one-piece element designed to perform a simple function in an assembly, module, unit, equipment, or facility; and normally used to repair an assembly or module.

48. PERFORMANCE CHECKS. As used in maintenance handbooks issued in 1970 and later, performance check is a periodic scheduled test, measurement, or observation of normal operating controls and functions, which is necessary to determine whether a system is operating within its established tolerances and limits. PM activities prescribed in the later maintenance handbooks are separated into "performance checks" and "other maintenance tasks." This term is also used in maintenance handbooks issued before 1970, but in these handbooks it means a procedure required evaluating the performance of a system rather than just the description of the activity.

49. PERIODIC MAINTENANCE (PM). As used in maintenance handbooks issued in 1970 and later, any scheduled PM activities that include performance checks and/or maintenance tasks are periodic maintenance activities.

50. PREVENTIVE MAINTENANCE. The routine maintenance designed to preserve the equipment or to reduce the chance of failure. As used in handbooks issued prior to 1970, it covers all mandatory activities. Preventive maintenance may be used as a generic term discussing all kinds of tasks, including even nonscheduled tasks the performance of which meets the general definition.

51. PROTOTYPE. A System that is not within the configuration management specified in Order 1800.8, National Airspace Configuration Management, has been designated a prototype by the acquisition office, or is being used operationally to prove concept of operations or refine its functionality.

52. PSEUDO FACILITY/SERVICE. A pseudo facility is an activity not classified as an operating type facility, requiring the expenditure of maintenance manpower or material resources or which has been established to capture the effectiveness of a specified aeronautical service.

53. QUARTERLY. A scheduling term, meaning four times each year, and at

90-day intervals.

54. REPLACEABLE SPARE PART. This is a part interchangeable with a part being used equipment, but furnished separately and not required for operation except as a replacement (often called a spare part).

55. RESTORATION. Restoration encompasses the corrective maintenance activities required to return a system, subsystem, equipment, or Service to normal use following an interruption, equipment failure, or out-of-tolerance/limit condition.

56. RISK MANAGEMENT. Risk management is identifying, managing, eliminating and/or mitigating the chance of something bad happening.

57. SAFETY STOCK. This is the quantity of material stored on site to meet unpredictable fluctuations in operating requirements and provide sufficient lead-time to accommodate delays between ordering and receiving replenishment.

58. SEMI-ANNUAL. A scheduling term, meaning twice each year, and at 6-month intervals.

59. SEMI-MONTHLY. A scheduling term, meaning twice each month, and at approximately 15-day intervals. Also known as Bi-Weekly.

60. SEMI-WEEKLY. A scheduling term, meaning twice each week, and at 3- or 4-day intervals. Also known as Twice-Weekly.

61. SERVICE. A Service is an end product, resulting from a specific combination of system(s), subsystem(s), and/or equipment(s), delivered to a user (internal or external to the FAA) of the NAS.

62. SHALL. As used in maintenance documentation, "SHALL" denotes compulsory or mandatory action that the person being directed is obliged to take. For example: The equipment SHALL be adjusted to operate in accordance with directive tolerances. See Order 1320.1. (Also see Should, Will, and May.)

63. SHOULD. As used in maintenance documentation, "SHOULD" denotes an action that desirable but not mandatory. For example: The equipment SHOULD be shut down if, in the opinion of the System Specialist, a failure is imminent. See Order 1320.1. (Also see Shall, Will, and May.)

64. SIGNIFICANT EVENT. An event that affects NAS systems and requires notification.

65. SOFTWARE. A set of programs, procedures, rules, and documentation concerned the operation of a data processing system; for example, compilers, library routines, and manuals.

66. SPECIAL MAINTENANCE PROCEDURES. As used in maintenance technical handbooks issued in 1970 and later, a special maintenance procedure is the prescribed procedure for doing incidental, nonscheduled tasks. This may include repair, adjustment, calibration, alignment, and other procedures. The term was not used in maintenance technical directives issued before 1970.

67. SPECIALLY SELECTED STANDARD PARTS. These are replaceable parts readily from commercial sources, which have been selected on the basis of special treatment, reliability tests, and/or high performance validation.

68. STANDARD. As used in maintenance technical directives, a standard is the value (on which the initial and operating tolerances are based) assigned to an essential parameter of a system, subsystem, or equipment. Design plans and specifications usually establish this value.

69. STANDARD ALLOWANCE. This term is applicable to two categories of logistic support items—working equipment and test equipment. These are documented by facility type in tabular format, listing each line item by type designation or description and quantities required as officially approved to implement maintenance operations for all FAA facilities in the NAS.

70. STANDARD SPARE PARTS. These are replaceable parts readily available from commercial sources (often called "parts common".)

71. SUBSYSTEM. A subsystem is a portion of a system that performs a specific function.

72. SYSTEM. A system is a combination of subsystem(s) and/or equipment(s) whose individual functions produce by engineering design a specific operating product in the NAS.

73. SYSTEM COMPONENT (SYSTEM ELEMENT). This may be a major operating element, or passive, which would affect the overall performance or characteristics of the system if removed or maladjusted.

74. TASK. A task is a unit of work to be performed under each activity. These tasks are identified according to the maintenance handbook subparagraphs at the lowest subparagraph.

75. TEMPORARY MODIFICATION. A temporary modification is a non-permanently installed modification. The term as used informally, is usually intended to apply to either a "test modification" or an "emergency modification," but may also apply to a "training modification."

76. TEST MODIFICATION. A test modification is a temporary modification installed by the FAA Academy to facilitate training or a temporary modification installed in operational equipment in the NAS to verify the effectiveness of a proposed modification. See Order 6032.1.

77. TRIAL MODIFICATION. A trial modification is usually synonymous with a "test modification." See Order 6032.1.

78. TWICE-WEEKLY. A scheduling term, meaning twice each week, and at 3- or 4-day intervals. Also known as Semi-Weekly.

79. TYPE DESIGNATION. A FAA type designation is an assigned combination of alphanumeric characters used to identify specific production equipment, custom-built for FAA. The identification is also imprinted in the equipment nameplate. Examples are FA-9996, FAA-7201, RTA-2, and ASR-9. See Order 0000.1, FAA Standard Subject Classification System.

80. UTC (COORDINATED UNIVERSAL TIME). UTC is the time provided in the worldwide signal broadcasts used in aviation. It has replaced Greenwich Mean Time as the accepted standard clock time in many countries.

81. VALIDATION. Validation is the second step in the certification process. It involves the act of making a legal statement or declaration.

82. VERIFICATION. Process similar to Certification except performed by Non-Federal personnel as defined by Order 6700.20, Non-Federal Navigational Aids and Air Traffic Control.

83. WAIVER. A written authorization to change an item not under configuration management. Waivers are requested in the form of a local NCP.

84. WEEKLY. A scheduling term, meaning once each week, and at 7 day intervals.

85. WILL. As used in maintenance documentation, WILL is intended to denote action the future tense. For Example: Obsolete equipment WILL be replaced as soon as funds can be made available. See Order 1320.1. (See also Shall and May.)

86. WORKING EQUIPMENT. This is a category of equipment that includes all special tools, devices, and accessories required to install, adjust, or align operating equipment in performance of maintenance operations, exclusive of test equipment. See Order 4630.2, Standard Allowance of Supplies and Working Equipment for National Airspace System Facilities.

APPENDIX 2. MAINTENANCE AND SUPPORT LEVELS

The following chart outlines maintenance and support levels as they apply to AF.

First Level: Maintenance Performed by personnel directly responsible for specific system(s).	Second Level: Engineering Support Personnel responsible for system type(s) contribute to:	Third Level: Logistical Support Responsibilities of the FAA Logistic Center (depot) or Original Equipment Manufacturer (OEM) for logistical support.
Periodic Maintenance	Periodic Maintenance	
(1) Preventive Maintenance Inspections (2) Performance Checks & Status Monitoring (3) Routine Maintenance	(1) Developing and publishing procedures (2) Developing and publishing standards and tolerances	
Corrective Maintenance	Corrective Maintenance	Corrective Maintenance
(1) Restoration (2) Troubleshooting (3) System reset & reconfiguration (4) Repair and replacement	(1) Developing and publishing procedures (2) Developing and publishing standards and tolerances (3) Providing remote and on-site support to first-	(1) Stocking spare LRUs (2) Shipping/receiving LRUs

(5) Alignment and tuning (6) Parameter Setting	level maintenance	
Certification	Certification	
(1) Initial (2) Periodic (3) After Corrective Maintenance (4) Post-accident/Incident Evaluation	(1) Developing procedures (2) Publishing procedures	
Modification	Modification	
(1) Installation of Modification (2) Functional check-out/testing	(1) Configuration Management (2) Engineering Modifications (3) Tracking Modifications (4) Developing software changes (5) Stocking and shipping modifications	
Documentation	Documentation	
(1) Documenting maintenance (Logging) (2) Documenting modifications (Data Entry) (3) Maintaining onsite technical publications (Handbooks, TIs, FRDF, redlining prints) (4) Spares management, processing logistical data and documentation	(1) Configuration management of Technical Instruction Books	

APPENDIX 3. SYSTEMS, SUBSYSTEMS, AND SERVICES REQUIRING CERTIFICATION

Appendix 3 is maintained electronically and is available on the World Wide Web. The

address is: http://www.faa.gov/ats/aaf/aop/300/6000.15/.

The published appendix on the web shall be considered official. Updates to this appendix shall be published on the Internet 4 times per year, the first day of each quarter. A short electronic bulletin shall be sent out to alert the field organizations whenever a revision occurs. All additions, deletions, or corrections will be annotated with an asterisk for easy reference.

Personnel responsible for maintaining a technical order library are authorized to print new versions from the web and insert them into this handbook at anytime.

APPENDIX 4. FACILITIES NOT REQUIRING MAINTENANCE LOGS

1. GENERAL. Facilities listed are not required to be the subject of a maintenance log:

Facilities Considered as Pseudo Facilities			
ADM	ERMS	MX	SSU
ATBM	ETB	NAS	SU
ATCC	FAB	NMCE	SUDS
ATRAM	FCPU	NOM	SWG
BLDG	FLD	OFFRD	TDS
CBI	GUARD	OLD	TELEX
CCTV	HDQ (SERIES)	PX	TIM
CCF	HEAT	QS	TOWB
CLM	HELI	RID	TR
COMP	LABS	SAL	VEHS
CTRB	LAN	SAN	WHDQ
CUE	LIVQ	SDM	WSM
CTERM (PC's for administrative	MAREQ	SFAS	.
DCBUS	MCC	SMO	.
DIO	MCT	SMUX	.
ELD	MED	SPS	.
EOF	MDS	SSC	.

2. Additionally:

a. An ATBM will not require a log unless the facility is used to capture additional facility workload.

b. A RMLR consisting solely of a passive reflector will not require a log.

APPENDIX 5. LIST OF RELATED PUBLICATIONS

1. GENERAL. The following publications provide guidance to Airway Facilities personnel for use in the performance of their maintenance technical duties. Except for the AT directives, these documents have been distributed to System Management Office level and should be available there for general reference and use. The AT directives are available at the local Air traffic facility.

a. 0000.1 FAA Standard Subject Classification System.

b. 1050.10 Prevention, Control, and Abatement of Environmental Pollution at Facilities.

c. 1050.14 Polychlorinated Biphenyl's (PCBs) in the National Airspace System.

d. 1280.1 Protecting Privacy of Information About Individuals.

e. 1320.1 FAA Directives System.

f. 1320.37 Contractor Development Equipment Instruction Books.

g. 1350.14 Records Management.

h. 1350.15 Records Organization, Transfer, and Destruction Standards.

i. 1370.82 Information Systems Security Program.

j. 1375.4 Standard Data Elements and Codes-Facility Identification and Supplemental Standards.

k. 1600.2 Safeguarding Controls and Procedures for Classified National Information and Sensitive Unclassified Information.

l. 1600.6 Physical Security Management Program.

m. 1720.18 FAA Distribution System.

n. 1720.30 Distribution of Systems Maintenance Service Technical Directives Affecting Airway Facilities.

o. 1800.8 National Airspace System Configuration Management.

p. 3400.3 Airway Facilities Maintenance Personnel Certification Program.

q. AF 3450.1 Airway Facilities Technical Employee Suggestion Program.

r. 3900.19 Occupational Safety and Health Program.

s. 3900.32 Agency Compliance With Occupational Safety & Health Administration Standards: APM National Abatement Plan.

t. 4250.9 Field Material Management and Control Handbook.

u. 4620.3 Initial Support for New or Modified Equipment Installation.

v. 4630.2 Standard Allowance of Supplies and Working Equipment for National Airspace System Facilities.

w. 4650.20 Reporting and Replacement of Items Failing Under Warranty.

x. 4660.1 Real Property Handbook

y. 4670.2 Motor Vehicle Management.

z. 4800.2 Utilization and Disposal of Excess and Surplus Personal Property.

aa. 6000.5 Facility, Service, and Equipment Profile.

bb. 6000.6 United States Interagency Ground Inspection Manual for Air Traffic Control and Navigational Aid Facilities.

cc. 6000.41 Policy Governing Contractor-Assisted Maintenance for the National Airspace System.

dd. 6000.48 General Maintenance Handbook for Automated Logging.

ee. 6000.50 Airway Facilities National Airspace System Operations Handbook.

ff. 6030.18 Mobile Air Traffic Control, Navigational Aid, Communication, and Power System.

gg. 6030.31 Restoration of Operational Facilities.

hh. 6030.41 Notification Plan for Unscheduled Facility and Service Interruptions and Other Significant Events.

ii. 6030.45 Facility Reference Data File.

jj. 6032.1 Modifications to Ground Facilities, Systems, and Equipment in the National Airspace System.

kk. 6040.6 Airway Facilities NAS Technical Evaluation Program.

ll. 6040.15 National Airspace Performance Reporting System.

mm. 6200.4 Test Equipment Management Handbook.

nn. AF 6430.49 Ground Rules for Air Defense Command and CAA Joint Use of Radar Facilities.

oo. 6480.2 Maintenance Of Mobile Air Traffic Control Towers.

pp. 6700.16 Maintenance of Mobile VHF Omnirange (VOR) Facilities.

qq. 6700.20 Non-Federal Navigational Aids and Air Traffic Control.

rr. 6930.1 Fire Prevention and Maintenance of Fire Protection Equipment.

ss. 6980.25 Maintenance of Batteries for Standby Power

tt. 7210.3 Facility Operations and Administration.

uu. 7340.1 Contractions.

vv. 7610.4 Special Military Operations.

ww. 7930.2 Notices to Airmen (NOTAMS).

xx. 8020.11 Aircraft Accident and Incident Notification, Investigation and Reporting.

yy. OA P 8200.1 United States Standard Flight Inspection Manual.

APPENDIX 6. FAA FORMS

The following FAA Forms are referenced in this Order 6000.15C.

Form #	Title	NSN	Unit of
1800-2	NAS Change Proposal	0052-00-801-	SH
4650-	Warranty Failure Report	0052-00-030-	PD
6000-8	Technical Performance Record	0052-00-686-	PD
6030-1	Facility Maintenance Log	0052-00-028-	PD
6032-1	Airway Facilities Modification	0052-00-620-	SH
6040-4	Equipment Failure Report	0052-00-697-	PD
7230-4	Daily Record of Facility Operation	0052-00-024-	SH

Preaddressed Comment Sheet

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